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A

COMPENDIUM

OF THE

ANATOMY

OF THE

HUMAN BODY.

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A COMPENDIUM OF THE ANATOMY OF THE HUMAN BODY.

INTENDED PRINCIPALLY FOR THE USE OF STUDENTS.

By ANDREW FYFE.

IN TWO VOLUMES.

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PART IV.

OF THE

VISCERA,

AND

ORGANS OF THE SENSES.

OF THE

VISCERA,

AND

ORGANS OF THE SENSES.

OF THE COMMON INTEGUMENTS.

The Cuticle.

THE *Cuticle*, *Epidermis*, or *Skarf-Skin*, is a thin semi-transparent insensible Membrane, which covers the Skin, and adheres to it by small Vascular Filaments.

The Cuticle is readily *separated* from the Cutis by boiling water, or by putrefaction, and in the living body, by the application of blisters.

It is not every where of the same *density*, being even in the Fœtus, thickest in the Palms and Soles ; in which parts, the thickness is afterwards much increased by pressure.

The *External Surface* is marked by *Furrows*, which correspond with those in the Cutis Vera.

Upon the Surface of the Body it is *perforated* by the termination of the Exhalent Vessels,—which throw out the Perspirable Matter, and which, when increased, is considered by most of the modern Physiologists, as forming the Sweat ;—by the ends of the Excretory Ducts, which are found in particular parts of the Skin ;—by the beginnings of the Absorbents, which take in certain Substances applied to the Surface of the Skin ; and—by the different Hairs.

The *Perforations*, or *Pores*, are most evident upon the Palms

Palms and Soles, and upon the Nofe, Ears, and external parts of Generation.

The Cuticle *covers* the Skin through its whole extent, excepting under the Nails.

From the External Surface of the Body, it is *reflected inwards*, to line the large Paffages; as the Alimentary Canal, the Trachea, the Urethra, Vagina, &c.

In thefe Paffages, however, the Cuticle becomes lefs uniform in its texture; and in fome of them, as in the *Stomach*, is either awanting, or is fo much changed in ftructure, as to have the appearance of being fo.

From the Surface of the Cuticle, certain *Proceffes* are fent into the Skin, which line the Paffages by which the Cutis is perforated.

Many opinions have been advanced concerning the *origin* of the Cuticle:—the lateft and moft probable is, that it is formed by a condenfation of the Corpus Mucofum, or by the Extremities of Excretory Veffels;—its denfity, however, is fuch, that no Veffels can be traced in it, either by the Eye or by the affiftance of glaffes.

The Cuticle ferves to protect the fenfible parts under it; and to regulate the proportion of the Fluids thrown out or taken in by the Surface of the Skin;—particularly to prevent too great a degree of evaporation.

Corpus Mucosum.

The *Corpus Mucofum* has been commonly called *Rete Mucofum*, from the fuppofition that it is formed of a *Mucous Net-work*, and is fituated under the Cuticle which it connects to the Cutis Vera.

It is *compofed* of the terminations of extremely minute Veffels paffing between the Cutis and Cuticle, which are furrounded by a Mucilaginous or Vifcid Subftance, properly called *Corpus Mucofum*.

It is the chief caufe of that *variety of colour* which characterifes the natives of different climates, and different people of the fame climate, being white, or rather of a light-gray femi-tranfparent colour in the European, black in the Ethiopian, brown in the Afiatic, &c.

It is *thicker* and *ftronger* in the Negro than in the white perfon, and can be readily feparated in the former into two Layers.

It covers every part of the Surface of the Cutis, excepting below the Nails, where it is awanting; and is

of

of ſuch a light colour in the Palms and Soles of the Negro, as to have been ſuppoſed by ſome authors to be deficient there alſo.

Its *origin* has not yet been ſufficiently aſcertained, nor is it fully determined what particular purpoſes it ſerves.

Among other purpoſes, however, it contributes to preſerve the ſtructure of the tender Veſſels, Ducts, and Papillæ, placed between the Cutis and Cuticle; and in the Negro, it is ſuppoſed to ſerve as a defence againſt the heat of the climate, by preventing the rays of the Sun from penetrating the Skin.

Cutis Vera.

The *Cutis Vera*, or *Skin*, properly ſo called, lies immediately under the Corpus Mucoſum, and gives a general covering to the whole Body.

It is *formed* of Fibres intimately interwoven, and running in every direction, and is ſo plentifully ſupplied with Nerves and Blood-Veſſels, that the ſmalleſt puncture cannot be made in any part of it, without occaſioning pain and bringing Blood.

The *Blood Veſſels* of the Cutis are ſo numerous, as to appear to form almoſt the whole of its Subſtance, and are of ſuch a ſize as to be readily injected.

It is ſtrong and elaſtic, and may be elongated in every direction, after which it recovers its former dimenſions.

It forms the body of the Skin, and is that part in Quadrupeds of which Leather is made.

The *outer part* of it is denſe and firm, the inner looſe, and gradually degenerating into the common Cellular Subſtance.

It is thicker and looſer on the poſterior than on the anterior part of the Body, and thicker and firmer in the Palms and Soles than in the other parts of the extremities.

The *colour* of the Cutis alſo differs in different parts of the body, in proportion to the quantity of Blood in the extreme Veſſels, and to the thinneſs of the Cuticle.

At the *edge of the Eye-lids*, the *red part of the Lips*, and *margin of the Anus*, the Cutis becomes ſo immediately and remarkably thin, as to appear to be loſt.

Upon the Surface of the Cutis, *ſmall Eminences* are obſerved, called *Papillæ*, *Papillæ Nervoſæ*, and *Papillæ Pyramidales*; the term being borrowed from the Papillæ of the

the Tongue, which were firſt diſcovered, and to which the name is moſt applicable.

They are conſidered as forming the Organ of Touch, from their being extremely ſenſible; and from their being very Vaſcular, they are alſo regarded as furniſhing a paſſage to part of the Perſpirable Matter.

The *Papillæ* are moſt evident in the Palms and Soles, where they are placed in double rows upon the ridges, which on the points of the Fingers and Toes, generally run in a ſomewhat ſpiral and parallel direction.

The *Ridges* are ſuppoſed to defend the Papillæ, and to increaſe the Surface for Perſpiration.

In ſome places, as in the red part of the Lips, the Papillæ are termed *Villi*, from their reſemblance to the pile of Velvet.

Various kinds of *folds* are obſerved in the Skin; ſome depending upon the form of the Cellular Subſtance, as in the Hips; others on Muſcular Contraction, as in the Fore-head; and others on Articular Motion, as at the Joints of the extremities,—particularly thoſe of the Fingers and Toes;—and theſe folds are thinner than the reſt of the Skin, to allow eaſy motion.

In an *inflamed Skin*, as in the caſe of Small-pox, a Reticular Texture of Veſſels is obſerved, which can be eaſily injected, and has been conſidered by ſome as the Corpus Mucoſum, and by others as an additional Cuticle;—but no ſuch appearance is to be met with in the ſound Skin.

The Cutis Vera ſerves to cover and give form to the Body, it unites the different parts, and defends them from injury. It forms the External Organs of Senſation or of Touch, and gives paſſage to the Fluids which are Perſpired or Abſorbed.

APPENDAGES OF THE SKIN.

NAILS.

The *Nails* were formerly regarded as a continuation of the Papillæ of the Cutis, but are now more generally conſidered as a continuation of the Cuticle.

They are removed along with it by boiling water, or by maceration.

Like

Like the Cuticle alſo, they are inſenſible, are renewable after having been ſeparated, and have no evident Veſſels.

They differ from it, however, in ſtructure, being formed of *Plates*, and theſe of *Longitudinal Fibres*, which are cloſely compacted.

They begin by a ſquare root, a little before the laſt Joint of the Fingers and Toes.

When ſeparated from the Skin, they are *tranſparent* like Horn, but are coloured in the living Body by the Veſſels of the Cutis, to which they adhere, and from which they derive their nouriſhment.

They are fixed at their roots to a *ſemilunar fold* of the Cutis, and are there covered by a reflection of the Cuticle, which firmly adheres to them.

They grow from the roots, and not from the points.

The nails ſtrengthen and defend the ends of the Fingers and Toes, and thereby ſerve as Buttreſſes.

In the Fingers they increaſe the power of apprehenſion, being uſeful in laying hold of minute objects.

Hairs.

The *Hairs* ariſe by roots or bulbs, which are ſituated in the Cellular Subſtance under the Skin.

The *Bulbs* are of various ſhapes in different parts of the Body, and have Blood-Veſſels diſperſed upon them for their nouriſhment.

Each of the Bulbs has *two Membranes*, or *Capſules*, containing an Oily Fluid between them, which gives colour to the Hair, and for want of which, as in advanced life, or in certain diſeaſes, the Hair is ſuppoſed to change its colour, and become white. It may be remarked, however, that the Hair, after being cut off, continues uniformly to preſerve its colour.

The body of the Hair conſiſts of ſmaller hairs incloſed in a Membrane, and is ſomewhat of the nature of the Nails. Like them alſo, it grows only from the root.

The *uſe* of the Hair is not yet fully known.—It ſerves in general for the ornament, warmth, or protection of the different parts on or near which it is placed.

Sebaceous Ducts or Follicles, and Miliary Glands.

The *Sebaceous Follicles* derive their name from the Fluid they contain becoming like Suet, after acquiring a certain degree of consistency, or being inspissated by stagnation.

They are seated under the Cutis, and are found in greatest abundance in those parts which are exposed to the air, or to attrition; as in the Nose, Ears, Nipples, Groins, and external Parts of Generation.

The *Sebaceous*, or *Miliary Glands*, are so called from their contents, and from their resemblance to *Millet Seeds*, and are seated in the Axilla.

Other Miliary Glands are described by Authors as being placed under the Skin over the whole Surface of the Body, and as serving for the secretion of Perspirable Matter;—but they are not demonstrable to such a general extent; and the Sweat is considered as being derived from another source.

These Follicles and Glands secrete a Fluid which serves to lubricate the Skin, and defend it from the inclemency of the weather, or from the effects of friction.

Membrana Cellularis, or Tela Cellulosa, or Reticular, or Cellular Substance.

This is generally considered as one of the Integuments, though common to these and to the other parts of the Body.

It is *composed* of a fine web, formed of many Membranes joined irregularly together, and these made up of Cells, which communicate freely with each other wherever they are found.

It is very elastic, may be drawn out to a considerable extent, after which it suddenly recoils, and may be condensed or compacted to a great degree.

It lines the Skin, covers the Muscles in general, and enters in between their different Fibres;—is an universal covering to all the other parts, and even enters into the composition of almost every one of them.

It is thickest where the parts are most exposed to pressure, as in the Hips, Palms, and Soles.

The

The different Cells of which it is compoſed, are conſtantly moiſtened by an Interſtitial Fluid, and in many parts of the Body are filled with Fat.

It has little or no ſenſibility, can be handled freely, or cut or punctured without giving pain.

It ſerves to connect parts to each other,—but ſo as to prevent them from growing together;—it covers them, ſupplies them with ſheaths to move in, and contains the Fat.

Corpus Adiposum, Adeps, Pinguedo, or Fat.

The *Fat* is lodged in the common Cellular Subſtance, but without communicating with it, and is made up of Maſſes compoſed of ſmall Veſicles containing the Fat, and theſe are ſurrounded by a net-work of Blood-Veſſels, from which the Fat is ſuppoſed to be ſecreted, without the intervention of Glands.

The *Veſicles* are not found to have any communication with each other, nor have any Excretory Ducts yet been perceived in them,—the Fat being ſuppoſed to tranſude from the Cells.

It is of *different conſiſtency* in different parts of the Body: In the living Body it is generally fluid, though in ſome parts it approaches to a ſolid, and is altogether of this nature in the dead Body.

In the Bones it forms the *Marrow*, which has been formerly deſcribed.

The Fat is chiefly *ſituated* immediately under the Skin, and covers almoſt the whole Surface of the Body. It is alſo found between the different Muſcles and Fibres of Muſcles,—within the Orbits, and in the Cheeks,—in the Subſtance of the Mammæ, and about the Heart.

It *abounds* in the Abdomen, about the Kidneys, Loins, Omentum, and Meſentery;—and in the Joints it forms the Subſtances called *Glands of the Joints*, already mentioned.

The Fat is *awanting* in the Scrotum, Penis, and Eye-Lids, and is found only in ſmall quantity in the Forehead, or about the Joints, where, from its bulk, it would have been inconvenient.—It is alſo awanting in the Subſtance of the Viſcera ſituated in the great Cavities of the Body; as the Brain, Lungs, Liver, Spleen, Kidneys, &c.

The

The Fat ſerves to lubricate every part of the Body to which it is connected. and facilitates the action of the Muſcles. It fills the Interſtices, ſo as to give form and ſmoothneſs, and guard againſt preſſure. It ſerves alſo as a reſervoir of nouriſhment.

PANNICULUS CARNOSUS,

Deſcribed by the Ancients as an

ADDITIONAL COVERING.

This is a general Covering found in the Quadruped, and formed by a thin Subcutaneous Muſcle, which ſerves to agitate the Skin.

It is found only in certain parts of the Human Body; as in the Fore-head, where it is formed by the Occipito-Frontalis Muſcle; and in the Neck, where it is formed by the Platyſma Myoides.

OF

OF THE BRAIN.

THE term *Brain* is applied to the whole of that Mafs which, with its furrounding Membranes, fills the Cavity of the Cranium; and is larger in Man, in proportion to the fize of the body, than in any other animal.

The *Membranes* of the Brain were called *Meninges* and *Matres* by the Ancients, from an idea that they gave birth or origin to all the other Membranes of the Body.

They confift of the *Dura Mater*, *Tunica Arachnoidea*, and *Pia Mater*.

The DURA MATER, named from its being of a firmer texture than the other two Membranes, inclofes the Brain and all its Appendages, and lines the different parts of the Cranium.

It is *compofed* of one Membrane, which, in feveral parts, is divifible by maceration into two, or even more layers of Fibres.

The *texture* of the Dura Mater is very denfe. It is the thickeft and ftrongeft Membrane of the Body, and is compofed of Tendinous-like Fibres, which have a fhining appearance, particularly in its inner Surface. In many parts thefe Fibres run in a variety of directions, and decuffate each other at different angles.

The Dura Mater *adheres* every where to the Surface of the Cranium, in the fame manner as the Periofteum adheres to the Bones in the other parts of the Body; but it is more firmly connected at the Sutures and Foramina than elfewhere; and fo much more firmly in Children than in Adults, that in feparating it from the Cranium, it is apt to bring along with it fome of the Fibres of the Bone to which it is attached.—In the adult, the feparation of the Bone from the Membrane is lefs difficult, in confequence of many of the Fibres being obliterated.

The *inner Surface* of the Dura Mater, which is remarkably fmooth, is in *clofe contact* with the Brain, but *adheres only* where the Veins go into the Sinufes,—and is lubricated by a Fluid difcharged through its Veffels, which guards the Brain from danger, according as it may be affected by the different ftates of Refpiration.

The

The Dura Mater ſerves as a *defence* to the Brain, and ſupplies the place of a *Perioſteum* to the inſide of the Bones of the Cranium, giving nouriſhment to them,— as is evident from the numerous drops of Blood which appear after removing the Skull-cap.

From the inner ſide of the Dura Mater, *Proceſſes* are ſent off, which divide the Brain into certain parts, and ſerve to keep it ſteady, *viz.*

I. The FALX, *Superior Longitudinal Proceſs*, or *Septum Cerebri*, which is formed by a doubling of the Dura Mater, and is ſituated between the Hemiſpheres of the Brain.

It *begins* at the middle of the Sphenoid, and Criſta Galli of the Ethmoid Bone, and runs along the upper and middle part of the Head, adhering firſt to the Frontal, then to the joining of the Parietal, and afterwards to the middle of the Occipital Bone.

In its paſſage it becomes gradually broader, extends from the Cranium to near the Corpus Calloſum, and terminates behind in the middle of the Tentorium.

It runs from behind forwards in a ſtraight direction, and has ſome reſemblance in ſhape to a *Sickle* or *Scythe*, from which circumſtance it has obtained the name of *Falx*.

Between the under edge of the Falx and Baſe of the Cranium, there is a *large ſpace, of an oval form*, occupied by that part of the Brain which is common to the two Hemiſpheres.

The Falx ſupports the Tentorium, and prevents the two ſides of the Brain from preſſing upon each other.

II. The TENTORIUM CEREBELLI, or *Tranſverſe Septum*, or *Lateral Proceſſes* of the Dura Mater.

The *Tentorium* is continued laterally from the Falx, is connected behind to the inner Tranſverſe Ridges and Grooves of the Occipital Bone, and at the fore and outer edges, to the Ridges and great Angles of the Temporal Bones, and terminates at the Poſterior Clinoid Proceſs of the Sphenoid Bone.

Between the middle and inner edges of the Tentorium and poſterior Clinoid Proceſs of the Sphenoid Bone, there is a large *Notch*, or *Foramen Ovale*, where the Brain and Cerebellum are united, or where the Tuber Annulare is chiefly ſituated.

The Tentorium keeps the Falx *tenſe*, and forms a *floor* or *vault* over the Cerebellum, which prevents the Brain from preſſing upon it.

III.

III. The FALX MINOR, or *Septum Cerebelli*, which is placed between the Lobes of the Cerebellum. It descends from the under and back-part of the Falx and middle of the Tentorium, adheres to the inferior Longitudinal Spine of the Os Occipitis, and terminates insensibly at the edge of the Foramen Magnum of that Bone.

Besides the Processes of the Dura Mater already described, there are four of inferior consideration, two of which are situated at the sides of the Sella Turcica, and two at the edges of the Foramina Lacera.

Several other Processes pass out at the different openings of the Cranium, to be connected to the Pericranium, or to accompany the Spinal Marrow and Nerves.—These of the last description shall be afterwards taken notice of.

The *Arteries* of the Dura Mater are derived chiefly from the External Carotids, and partly from the internal Carotids and Vertebrals.

The *Veins* of this Membrane are of two kinds.—One set of them, like the Veins in other parts of the Body, accompany the Arteries;—the others are termed *Sinuses*, and differ from Veins only in this, that they are of a triangular Figure, and inclosed in a doubling of the Dura Mater, which is so tense over them, as to be little affected in consequence of the pressure from surrounding parts.

In the bottom of the Sinuses are *small Transverse Cords*, termed *Chordæ* WILISII, which may add a little to their strength, and assist in preventing them from being too much distended.

The Sinuses serve to carry the Blood from the Brain, and convey it to the Veins of the Neck, for which purpose they are properly fitted, their covering from the Dura Mater giving them strength, and their frequent communications preventing congestion.

The Principal SINUSES *are*,

I. The SUPERIOR LONGITUDINAL SINUS, which begins at the Crista Galli of the Ethmoid Bone, runs along the upper edge of the Falx, becomes gradually larger in its progress, and terminates in the Lateral Sinuses.

II. The TORCULAR HEROPHILI, or *fourth Sinus* of the Ancients; the term *Torcular* is applied to it from a supposition that the Blood is squeezed in that Sinus as in

a Wine-prefs.—It is chiefly formed of the Vena Galeni, runs between the Falx and Tentorium, and terminates with the former Sinus in the beginning of the Lateral Sinufes.

III. The Two LATERAL SINUSES, which are formed by the Longitudinal and Torcular Sinufes, run in depreffions of the Occipital and Temporal Bones, firft tranfverfely, then in a winding direction downwards, and terminate at the Bafe of the Cranium, in the beginning of the Internal Jugular Veins.

Befides the Sinufes mentioned above, feveral others of lefs confideration will be pointed out in the particular defcription of the Veins.

The *Nerves* of the Dura Mater are fo very minute, that they have not as yet been diftinctly traced, and it is found to poffefs very little fenfibility in the found ftate.

Upon the fide of the fuperior longitudinal Sinus, and contiguous parts of the Brain, there are *numerous fmall Granulations*, of a *whitifh* colour, called *Glandulæ* PACCHIONI.

Befides thefe Granulations, there are others of the fame name, of a *Flefhy* colour, fituated on certain parts of the outer Surface of the Dura Mater, and frequently projecting fo much as to form deep pits in the Skull.

The nature of thefe Granulations is ftill unknown.—By fome they have been fuppofed to belong to the Lymphatic Syftem.

The TUNICA ARACHNOIDEA, named from its cob-web appearance, is an exceedingly thin, tender, and tranfparent Membrane, in which no Veffels have heen hitherto obferved.

It is fpread uniformly over the Surface of the Brain, inclofing all its Convolutions, without infinuating itfelf between any of them.

At the upper part of the Brain, it adheres fo clofely to the fubjacent Coat by fine Cellular Subftance, that it can fcarcely be feparated from it ; but in different parts of the Bafe of the Brain, particularly about the Tuber Annulare and Medulla Oblongata, it is merely in contact with the Membrane under it, and may readily be raifed from it by the affiftance of the Blow-pipe.

The Tunica Arachnoidea, like the Cuticle, covers and defends the parts under it.

The

The PIA MATER, named from its tendernefs, is fomewhat of the nature of the former covering, but is extremely Vafcular.

It covers the Brain in general, enters double between all its Convolutions, and lines the different Cavities called Ventricles.

It ferves to contain and fupport the Veffels of the Brain, and allows them to divide into fuch minute parts, as to prevent the Blood from entering the tender Subftance of this Vifcus with too great force.

The *Arteries* of the Pia Mater are the fame with thofe of the Brain, and are derived from the Internal Carotids and Vertebrals.

The *Veins* differ in no refpect from thofe of the other Vifcera, excepting in this, that they do not accompany the Arteries.

The Brain is divided into *Cerebrum*, *Cerebellum*, *Tuber Annulare*, and *Medulla Oblongata*.

CEREBRUM.

The *Cerebrum* is fituated in the upper part of the Cranium, which it completely fills.

It is divided into two halves, termed *Hemifpheres*, which are feparated from each other by the Falx.

Each of the Hemifpheres is of an *oval form*, or they fomewhat refemble an egg cut into two longitudinal halves. The inner fides are flat, the upper and outer parts convex, and the under Surface irregular.

The under Surface is divided into *two Anterior*, *two Lateral*, and *two Pofterior Lobes*, or *Proceffes*.

The *Anterior Lobes* are fituated in the fore-part of the Bafe of the Cranium.

The *Lateral* or *Middle Lobes*, are lodged in the Foffæ formed by the Temporal and Sphenoid Bones.

The *Pofterior Lobes* are placed over the Cerebellum, and are feparated from it by the Tentorium.

Between the Anterior and Lateral Lobes, there is a *Furrow* formed by the Anterior Clinoid Proceffes of the Sphenoid Bone, which has been termed *Foffa*, or *Fiffura Magna* SYLVII.

The Surface of the Brain is divided into many turnings or windings, termed *Circumvolutions*, which run in various directions, and are of different fizes and lengths on different parts of the Brain.

 The

The Circumvolutions are every where connected to the Pia Mater by an infinite number of ſmall Veſſels,—called by RUYSCH, *Tomentum Cerebri*,—which run into the Subſtance of the Brain; as may be readily ſeen, upon ſeparating the Circumvolutions a little from each other.

Between the Hemiſpheres a white Subſtance is obſerved, called *Corpus Calloſum*, from its being a little firmer than the reſt of the Brain.—It goes acroſs the Brain, under the Falx, and is merely a continuation of Medullary Subſtance, running horizontally, and joining the two ſides of the Hemiſpheres to each other.

In the middle of the Corpus Calloſum there is a longitudinal *Raphe*, with a Medullary Cord on each ſide, from which many tranſverſe ſtreaks iſſue. Theſe Cords, like the Corpus Calloſum itſelf, become gradually broader towards the poſterior extremity.

An horizontal Section, a little above the middle height of the Brain, or upon a level with the Corpus Calloſum, ſhews the diviſion of the Subſtance of the Brain into outer or inner, or *Cortical* and *Medullary* parts.

The outer Subſtance is termed *Cineritious*, from its being of a *greyiſh* or *aſh* colour,—though a little tinged with brown;—and *Cortical*, from its *ſurrounding* the inner part of the Brain, as the Bark does the Pith of a Tree.

It is termed by ſome Authors Glandular, and by others *Secretory*, from a ſuppoſition that a Fluid was ſecreted in it.

The *Cineritious Subſtance* covers the Brain in general, and enters deep between its Convolutions, is of a ſoft conſiſtence, and compoſed of numerous ſmall Veſſels carrying red Blood; but it is uniform, and without any appearance of a Fibrous texture.

The inner Subſtance is termed *White* or *Medullary*, and is conſidered as giving origin to the different Nerves. It has been by ſome called *Excretory*, having been ſuppoſed to be formed of hollow Tubes continued from the Veſſels of the Cortical part;—but no Cavities have ever been obſerved in the ſoft Fibres of which it is compoſed.

It is greater in quantity, and ſomewhat firmer in texture, than the Cineritious Subſtance, and is ſo intimately connected as to appear to be a continuation of it.—The ſoft Fibres or ſtreaks of the Medullary Matter, run in general in a parallel and tranſverſe direction.

In many parts of the Cineritious Subſtance, Medullary

Matter

Matter appears; and, on the contrary, in different parts of the Medullary Subſtance, Cineritious Matter is found; the two being frequently blended together in the form of ſtreaks. *See* MONRO *on Nervous Syſtem.*

The *Centrum Ovale* of VIEUSSENS. This is the Medullary Subſtance of the Brain, forming a kind of Nucleus, which is ſeen after removing the Cineritious Subſtance, and all the Medullary parts mixed with it, which lie between the Cortical Convolutions.

To obtain a proper view of the Centrum Ovale, the Nucleus ought to be cut in ſuch a manner as to preſerve the Corpus Calloſum, and the ſame convexity with that of the general convexity of the Brain.

The Centrum Ovale forms an *arch* or *roof* over the two Lateral Ventricles; and the under part of this roof, which is ſmooth and uniform, conſtitutes the upper part of theſe Ventricles.

VIEUSSENS conſidered the Centrum Ovale as the *great Diſpenſatory of the Animal Spirits.*

The VENTRICLES of the Brain are four in number, two of which are called *Lateral.*

The four Ventricles have their ſides contiguous to each other, are chiefly formed of Medullary Matter, and are lined with a continuation of the Pia Mater, which differs from that covering the exterior Surface of the Brain, in having fewer Veſſels diſperſed upon it.

They are conſtantly moiſtened by a Fluid, which prevents their oppoſite ſides from adhering to each other.

The *uſe* of the Ventricles, like many other parts of the Brain, is ſtill unknown.

The *Lateral*, formerly called *Superior Ventricles*, are ſituated in the Hemiſpheres, one in each, and run Horizontally in the ſame direction with the Hemiſpheres themſelves.

They are of an irregular form, lying under the Centrum Ovale, and have each three winding corners, compared to Ram's Horns, which are therefore called *Cornua.*

The *Anterior Cornua* are ſeparated only by the Septum Lucidum.

The *Poſterior Cornua*, called alſo *Digital Cavities*, are at a conſiderable diſtance from each other, but approach nearer at their pointed extremities; while the *inferior Cornua*, the beginning of which is ſeen, run downwards and forwards, and terminate in the Lateral Lobes of the Brain.

In each of the Poſterior Cornua there is an Elongation, which terminates in a point, and is called *Ergot* by the French, from its reſemblance to the Spur of a Cock; or, *Hippocampus Minor*, from its ſimilarity to, and connection with, the ſubſtance termed *Hippocampus Major*.

In the fore-part of the bottom of the Lateral Ventricles, are two large Eminences, called *Corpora Striata*, which become gradually narrower, and recede from each other at their poſterior extremities.

The *Structure* of theſe is Cineritious externally, and mixed with Medullary Striæ within, ſome of which form large Tranſverſe Medullary Arches, and others run more in a ſtraight direction.

Between the poſterior parts of the Corpora Striata, are ſituated the *Thalami Nervorum Opticorum*, which have a roundiſh form and Medullary Surface, and are of a Striated appearance within, but the Striæ are leſs diſtinct than in the Corpora Striata.

Upon the Surface of theſe Bodies, there are ſmall *Eminences* or *Tubercles*, ſome of which are placed upon their ſuperior, and others upon their inferior extremities.

The inner parts of the Thalami are flat and contiguous, and above they are ſo cloſely connected as to form one continued Surface, called *Commiſſura Mollis* of the Optic Thalami.

The poſterior parts of the Thalami turn downwards and outwards, after which they are elongated, to form the two white Cords, called *Tractus Optici*.

In the Groove between the Corpora Striata and Thalami, there is a Medullary Band on each ſide, called *Centrum Semicirculare Geminum of* VIEUSSENS, or *Tænia Semicircularis of* HALLER, or ſimply *Tænia*.

Over the Thalami is placed the *Choroid Plexus*,—named from its being compoſed of a Chorus of Veſſels and Membranes. It is a fine Vaſcular Web, conſiſting of ſmall ramifications of Arteries and Veins, connected by the Pia Mater, and ſpread upon the Surface of the Thalami, and ſome of the adjacent parts.

The Choroid Plexus frequently contains numerous round *Globules*, reſembling Hydatids, which have been conſidered by ſome Authors as Lymphatic Glands.

Under the Raphe of the Corpus Calloſum, is placed the *Septum Lucidum*, which, when viewed laterally, is obſerved to be broad before, curved at its edge, and to become

become gradually narrower towards its posterior extremity.

It is connected above to the Corpus Callosum, below to the Fornix, and forms a distinct partition between the lateral Ventricles.

It is formed of two Cineritious and Medullary *Laminæ*, more or less separated from each other at their forepart, by a small Cavity, called *Fissure*, or *Fossa* of SYLVIUS, or *Sinus* of the Septum Lucidum, which, however, does not communicate with the Lateral Ventricles, though in some subjects it reaches a considerable way backwards, and, as well as the other Cavities of the Brain, has been found full of water in Hydrocephalous cases.

Under the Septum Lucidum is placed the Substance which has been compared in shape to a *Vault* by the Ancients, and from that has obtained the name of *Fornix*.

The *Fornix* is merely a continuation of the Corpus Callosum, and forms a sort of hollow Ceiling, with four *Pillars*, called *Crura*, or *Cornua*, from their winding direction, of which there are two anterior and two posterior.

The *two Anterior Crura* are short, run close together, and become enlarged at their inferior parts. The *two Posterior Crura* are long, considerably distant from each other, and form Curvatures which correspond with the course of the Inferior Cornua of the Lateral Ventricles.

That part of the Crura Fornicis lying in the Inferior Cornua of these Ventricles, forms thin borders, getting the name of *Corpora Fimbriata*; but, according to the VIC D'AZYR, they are more properly termed *Tænia Hippocampi*, from being united with the great Hippocampus.

The body of the Fornix is *narrow* anteriorly, and becomes considerably *broader* behind, where it is incorporated with the Corpus Callosum.

The under Surface of the posterior part of the body of the Fornix, is impressed with numerous transverse and oblique Lines, which have been called *Psalterium*, or *Lyra*, from some resemblance they bear to the ancient musical instruments of these names.

The body of the Fornix is joined above to the Septum Lucidum; below it is connected to the Thalami Optici by a Vascular Membrane, called *Tela Choroidea*, which spreads

ſpreads over the Thalami, and unites the Choroid Plexus of the Lateral Ventricles.

The Pedes Hippocampi, Great Hippocampus, or Cornua Ammonis,—named from a ſuppoſed reſemblance to theſe parts,—are two Medullary Eminences, which ariſe from the ſides of the poſterior extremity of the Corpus Calloſum, and are ſituated in the inferior Prolongations of the Lateral Ventricles.

They run through the whole extent of the Prolongations, firſt behind, then at the outer part of the poſterior Pillars of the Fornix, and are ſo intimately connected with them, that they have been conſidered by ſome Authors as forming part of the Pillars themſelves.

They are ſmall at their origin, from which they continue to increaſe to their farther extremity.

Like the greater part of the Ventricles, they are covered externally with a Medullary Lamina;—internally they are found to conſiſt of Medullary and Cineritious Laminæ, of a convoluted appearance.

At the inner edge of the Pedes Hippocampi, there is a *plaited, ſerrated*, or *indented Margin*, which, in the generality of Quadrupeds, is much larger, in proportion to the ſize of the Brain, than it is in Man.—The reſemblance, however, to the human kind, in the ſtructure of this particular part of the Brain, is more ſtriking in the Ape than in any other Quadruped.

In the bottom of the Lateral Ventricles, behind the anterior Crura of the Fornix, and before the meeting of the Choroid Plexuſes of theſe Ventricles, below the anterior part of the body of the Fornix, and over the fore-part of the third Ventricle, there is a Hole, of an *oval form*, by which the Lateral Ventricles communicate freely with each other. *See* Monro's *Obſ. on Nerv. Syſt.* 1783, and *Treatiſe on the Brain*, 1797.

After dividing and turning back the Fornix, another communication from the above paſſage is found, called *Foramen Commune Anterius, Vulva*, or *Iter ad Infundibulum*; but properly, Iter ad Tertium Ventriculum, or Paſſage to the third Ventricle.

Between the Commiſſura Mollis of the Optic Thalami, and Subſtance called Pineal Gland, there is a ſmall paſſage termed Anus, or *Foramen Commune Poſterius*, which has been ſuppoſed by ſome Authors to form a communication between the back-part of the third Ventricle

and

and Lateral Ventricles; but it is completely ſhut up by the Tela Choroidea, and alſo by the Fornix, which adheres cloſely to this Membrane.

The THIRD VENTRICLE is in form of a deep Fiſſure, placed between the inner ends of the Thalami Optici, having the Commiſſura Mollis of theſe Thalami ſituated above, the Crura Cerebri below, and the bodies of the Thalami on each ſide.

The INFUNDIBULUM is a paſſage of conſiderable ſize, of a Cineritious and Medullary ſtructure, which leads downwards and forwards, gradually contracting, and becoming ſolid at its under end, where it terminates in the *Glandula Pituitaria*, and thus, contrary to the opinion of the Ancients, preventing the paſſage of any Pituitous Fluid from it to the Noſe.

The GLANDULA PITUITARIA is of an oval form, about the ſize of a Field-Bean, lodged in the Sella Turcica, and ſurrounded by a doubling of the Dura Mater.

On the outſide it is of a browniſh colour, being formed of Cineritious Matter; it is whiter within, where it is mixed with Medullary Subſtance.

The Glandula Pituitaria was formerly ſuppoſed to abſorb a Fluid from the Infundibulum, and tranſmit it to the Noſe. It has been already mentioned, however, that the Infundibulum is impervious; and the real uſe of this Gland, as well as of the other Tubercles of the Brain, ſeems ſtill unknown.

At the fore-part of the third Ventricle, and immediately before the Anterior Crura of the Fornix, there is a white Medullary Cord, which runs tranſverſely through the Corpora Striata, and has the name of COMMISSURA CEREBRI ANTERIOR.

At the back-part of the third Ventricle, and under the root of the Pineal Gland, there is another Cord ſimilar to the former, but ſhorter, called COMMISSURA CEREBRI POSTERIOR. The *Commiſſuræ Cerebri* aſſiſt in uniting the two ſides of the Brain to which they are fixed.

From the under and back-part of the third Ventricle, there is a Paſſage which leads to the fourth, under the name of ITER AD QUARTUM VENTRICULUM, *Canalis Medius*, or *Aquæductus* SYLVII.

After the poſterior part of the Fornix, and the Tela Choroidea to which it adheres, have been removed, there appear at the back-part of the third Ventricle, be-

hind

hind the Thalami, and over the Iter a Tertio ad Quartum Ventriculum, the NATES and TESTES, or TUBERCULA QUADRIGEMINA, and PINEAL GLAND.

The NATES, or *Tubercula Quadrigemina Anteriora*, are placed uppermoſt, and are of a rounder form than the TESTES, or *Tubercula Quadrigemina Poſteriora*,—which lie immediately below the former.—The Teſtes are broader from one ſide to the other than from top to bottom, and of a white colour.

A longitudinal Section ſhews the Tubercula to be covered externally with a thin Medullary Lamina, and to be Cineritious within.

In Man they are more nearly of an equal ſize than in Quadrupeds, as in the Ox, Sheep, &c. in which the Nates are large, round, and of a brown colour, and the Teſtes ſmall and long.

Over the *Nates*, and under the back-part of the *Fornix*, is placed a ſmall body, of a Cineritious nature, about the ſize of a Garden-Pea, and of a Conoid figure, called GLANDULA PINEALIS, from its reſemblance in ſhape to a *Pine* or *Fir Cone*.

In conſequence of being always preſent, and ſeldom found in a diſeaſed ſtate, it has been celebrated by DES CARTES, as being, according to his ſuppoſition, the *Seat of the Soul*.

The *Pineal Gland* is fixed at its root to the Commiſſura Cerebri Poſterior, and ſends out *two long Medullary Peduncles*, or *Foot-ſtalks*, to be fixed to the upper and inner ſide of the Thalami, and to the Anterior Crura of the Fornix.

Near, or in the Subſtance of the Pineal Gland, ſmall Calcareous Concretions are ſometimes found, called by SOEMMERING, *Acervulus Cerebri*, from their being generally found collected in a heap.

They do not appear to be the effects of diſeaſe; nor are they met with till after the age of Puberty.

CEREBELLUM.

The *Cerebellum* is ſituated in the Inferior Foſſæ of the Occipital Bone, under the poſterior Lobes of the Brain, and is ſeparated from theſe Lobes by the Tentorium.

It is ſomewhat of a roundiſh form, though a little broader from one ſide to the other than from before back-

wards.

wards. It is only about a fifth or ſixth part of the ſize of the Cerebrum, and much ſimpler.

It is divided behind by the Falx Minor into two Lobes or Hemiſpheres, but has no ſeparation above like the Brain.

Its Surface is divided into numerous Circumvolutions, which form arches, decuſſating each other in many parts, at ſharp angles.

The Circumvolutions run chiefly in a lateral direction, and are formed of Laminæ, with deep Sulci between them, into which, as in the Brain, the Pia Mater inſinuates itſelf, which may be readily ſeen by making a puncture into the Arachnoid Coat, and blowing in air till it diſtend the Cellular Subſtance, and ſeparate the Coats from each other.

It has two middle Eminences, called *Appendices Vermiformes*, from their reſemblance to Earth-Worms, one of which is ſituated anteriorly and ſuperiorly, the other inferiorly and poſteriorly.

Each of the Lobes of the Cerebellum is again divided into *Monticuli*, or *Lobules*, which have different names according to their relative ſituations, connections with other parts, &c. They vary a little in different Subjects, but are beſt diſtinguiſhed from the direction of their Convolutions.

The Subſtance of the Cerebellum conſiſts of Cineritious and Medullary Matter, as in the Cerebrum; but the Cineritious bears a greater proportion to the Medullary in the former than in the latter.

When the Cerebellum is cut in a vertical direction, the Medullary part is then found to bear a ſtriking reſemblance to the branching of the ſhrub called *Arbor Vitæ*, from which circumſtance it has obtained the name of this ſhrub.

When cut in ſlices nearly parallel to the Baſe of the Brain, the Medullary Subſtance appears in Laminæ, correſponding to thoſe of the Surface of the Cerebellum; and when cut to a conſiderable depth, there is a Centrum Medullare uniting the lateral Lobes, as in the Brain.

Between the Cerebellum, the under part of the Tuber Annulare, and upper part of the Medulla Oblongata, the *Fourth Ventricle* is ſituated, which extends from the Eminences called *Teſtes* to the poſterior inferior Notch of the Cerebellum.

A little lower than the Teſtes, the Ventricle becomes wider, and forms an angle behind, from which again it contracts, and becoming narrower and pointed below like a writing-pen, is called *Calamus Scriptorius.*

Over the under end of the Aquæductus Sylvii, and upper part of the fourth Ventricle, there is a thin Medullary Lamina, called *Valvula*, but properly *Velum* VIEUSSENII.

At the ſides of the Velum Vieuſſenii there are two Medullary tracts, called *Proceſſus ad Teſtes*, or *Columnæ Valvulæ* VIEUSSENII.

The under end of the Ventricle is found to be ſhut up by its Choroid Plexus, which prevents any communication between this Cavity and that of the Spine.

UNDER SURFACE OF THE BRAIN.

Near the middle of the Baſe of the Brain, and between its Lateral Lobes, there are two ſmall, round, white bodies, termed *Eminentiæ Mammillares*, or *Corpora Albicantia*, Medullary without, Cineritious within, miſtaken by ſome Authors for Glands.

In the Corpora Albicantia, various Medullary *Strata* terminate, which come from different parts of the Brain.

Immediately before the Corpora Albicantia, two large white Cords are obſerved, called *Crura*, or *Pedunculi Cerebri*, or *Crura Anteriora Medullæ Oblongatæ*, which ariſe from the Medullary Subſtance of the Brain, and gradually approach each other in their courſe, till they unite with the Tuber Annulare.

Their Surface is flat, and compoſed of diſtinct Medullary Fibres; internally they are compoſed of a Mixture of Cineritious and Medullary Matter, the former of which being of a darker colour at one particular part than in any other of the Brain, has been termed *Locus Niger Crurum Cerebri.*

Between the Crura Cerebri and Corpora Albicantia, there is a Cineritious Subſtance, called *Pons* TARINI, which joins theſe two bodies of the oppoſite ſides together, and aſſiſts in forming the bottom of the third Ventricle.

From the Medullary part of the Cerebellum, which forms the trunk of the Arbor Vitæ, two white cords ariſe, under the name of *Crura Cerebelli*, or *Crura Poſteriora*, or *Pedunculi Cerebelli*, which unite with the Crura Cerebri, to compoſe the *Tuber Annulare*, or *Pons* VAROLII,

LII, so named from forming a Ring or Bridge over the Crura. This ring is intimately incorporated with, and formed by these Crura.

The *Tuber Annulare* is situated over the back-part of the body of the Sphenoid and Cuneiform Process of the Occipital Bone. Many transverse streaks run on its Surface, and it is divided into two lateral parts by a longitudinal depression, occasioned by the situation of the Vertebral Artery.

At the fore and back parts of the Tuber, are the *Foramina Cæca, Anterius et Posterius*, the former placed between the third, and the latter between the sixth Pair of Nerves: These two Foramina penetrate only a little way at the edges of the Tuber, and receive a Plexus of Vessels.

In the Substance of the Tuber, there is much Cortical Matter, which is formed into *Striæ*, running in different directions.

Continued from the Tuber, there is a large Substance in form of an inverted Cone, which extends to the Foramen Magnum of the Occipital Bone, under the name of *Medulla Oblongata*.

Upon the Surface of the Medulla Oblongata, two small Eminences appear, which run longitudinally and contiguous to each other, and from their shape have the name of *Corpora Pyramidalia*, or *Eminentiæ Pyramidales*.

Between the Corpora Pyramidalia, there is a deep Fissure, into which the Pia Mater penetrates, and where Blood-vessels pass into the interior part of the Medulla.

At the outside of the former Eminences, are two others, somewhat of the form of Olives, from which they are termed *Corpora Olivaria*, or *Eminentiæ Olivares*.

More externally than these, are two other Eminences, less evident than the former, which have been described by some Authors by the name of *Corpora Pyramidalia Lateralia*.

The Medulla Oblongata is divided into two lateral portions, by an anterior and posterior Fissure, and the two portions are formed of Medullary Matter without, and a large proportion of Cineritious Matter internally, and joined together by Medullary Fibres.

The BRAIN is the *Grand and Primary Organ of Sense*, with which the Mind is supposed to be most immediately and intimately connected, and from which the Nervous

 Influence

Influence is found, by experiment, to be communicated to all the other parts of the Body.

Origin *of the* Nerves.

The Nerves arise from the Medullary parts of the Brain, some in solid Cords, others in separate Threads which afterwards unite into Cords; and have their name in numerical succession, according to their situations, beginning anteriorly.

The *First*, or *Olfactory Pair of Nerves*, arise from the back-part of the posterior lobes of the Brain, and run towards the Crista Galli of the Ethmoid Bone, over which each forms a brownish-coloured Bulb, from whence numerous small Nerves are sent off.

The *Second Pair*, or *Optic Nerves*, are the continuations of the Thalami Optici. They are united immediately before the Infundibulum, and form an intimate intermixture of parts, and again separate previous to their passing into the Orbits.

The *Third Pair* arise by numerous Threads, which are soon collected into Trunks.

The *Fourth Pair*, which are the smallest Nerves of the Body, arise behind the Testes, and have a long and winding course.

The *Fifth Pair*, which are the largest Nerves in the Brain, have each an anterior small, and a posterior large Fasciculus, which arises from the side of the Tuber Annulare.

The *Sixth Pair* arise from the beginning of the Medulla Oblongata, where it joins the Tuber Annulare. Each of the Nerves of this Pair has a small Thread at its inner part.

The *Seventh Pair* arise from the beginning of the lateral parts of the Medulla Oblongata, and are divided on each side into a *Portio Mollis*, and *Portio Dura*.

The *Eighth Pair* arise by small Fasciculi from the Corpora Olivaria.

The *Ninth Pair of Nerves* also arise by small Fasciculi, a little below the former, from the Corpora Pyramidalia.

The Origin of the Nerves will be described at greater length, in a subsequent part of the Volume.

OF

OF THE EYE.

THE *Eyes*, which conftitute the Organ of Vifion, are fituated in the Cavities of the Orbits, and are furrounded by feveral parts, fome of which protect them from injury, and others affift in the performance of their various motions.

The *Orbits* are formed of two Cones, fituated in the fore-part of the Cranium, with their Apices behind, their Axes in an horizontal fituation, and their Bafes turned obliquely outwards.

Each of the Orbits is formed of different Proceffes of the following Bones, viz.

The upper part of each Orbit, by the Orbitar Plate of the Frontal Bone;—the inferior, by the Orbitar Plates of the fuperior Maxillary and Malar Bones;—the internal, chiefly by the Orbitar part of the Os Unguis and Pars Plana of the Ethmoid Bone;—the external, by the Orbitar Plates of the Sphenoid and Malar Bones;—the pofterior, by the Sphenoid and Palate Bones;—and the anterior edge of the Orbit, by the Frontal, fuperior Maxillary, and Malar Bones.

The Cavities of the Orbits are lined with Productions of the Dura Mater, which pafs out at the Foramina Optica and Lacera, and, at the anterior edges of the Orbits, join the Periofteum of the Face, where they fupply the place of Ligaments to the Palpebræ.

SUPERCILIA.

The *Supercilia*, or *Eye-brows*, which are peculiar to the Human fpecies, are the arches of Hair fituated upon the Superciliary Ridges of the Frontal Bone. The Hairs are placed obliquely, with their roots towards the Nofe, and the Arches elevated a little above the reft of the Fore-head, by a confiderable quantity of Cellular Subftance lying under the Skin.

They are moved in different directions by the action of

of the Frontal Corrugator, and Orbicularis Palpebrarum Mufcles.

They are intended partly for ornament, and partly as fhades over the Eyes, thereby preventing them from being injured by extraneous Matter, or by too great a quantity of light. They alfo affift in expreffing the paffions of the Mind.

Palpebræ.

The *Palpebræ*, or *Eye-lids*, are chiefly compofed of a doubling of the Skin, inclofing part of the Orbicularis Palpebrarum Mufcle, and the Cartilages called *Tarfi*, and forming angles at their outer and inner extremities, termed *Canthi*, or *Corners of the Eye*.

The *Upper Eye-lid* is the one which moves principally in clofing or opening the Eye, the under moving only when the Eye-lids are fhut with uncommon force.

The *motions* of the Eye-lids are performed by the action of the Orbicularis and Levator Palpebrarum Mufcles.

The Eye-lids ferve as Curtains or Veils, to defend the Eyes during fleep: They likewife prevent them from being injured by extraneous objects, or by too much light. By their frequent motion they increafe the fecretion of the Tears, apply them properly to the Surface of the Eye, and conduct what remains, after wafhing the Eye, to the Puncta Lacrymalia.

Tarsus.

This is a *thin Cartilaginous Arch*, fituated in the edge of each Eye-lid, that in the upper one being confiderably broader than the one below, and each broader at its middle than towards its extremities.

Their edges are fo placed, that when the Eye-lids are fhut, a groove is left next the Eye, by which the Tears are conveyed towards the Nofe.—They terminate at a little diftance from the inner angle of the Eye.

They ferve to keep the Eye-lids extended, allow them to be accurately applied to each other, and prevent them from being collected into folds.

Glandulæ Sebaceæ, Ciliares, or Meibomianæ,—the laft term obtained from their being defcribed by Meibomius,—are placed between the Tarfus and lining of the

the Eye-lids, and are formed of a ſeries of white lines or Follicles, running in ſerpentine directions, which, when viewed through a magnifier, appear like rows of Pearls, from which an Oily or Sebaceous Matter, reſembling little worms, may be readily ſqueezed out through the Foramina or Puncta Cilaria, placed upon the edges of the Eye-lids.

The matter of the Sebaceous Glands facilitates the motion of the Eye-lids, and prevents their accretion during ſleep.

Cilia.

The *Cilia*, or *Eye-laſhes*, are ſtiff Hairs placed in the edges of the Eye-lids. Thoſe of the upper Eye-lid are bent upwards, and are conſiderably longer than thoſe of the under Eye-lid, which are bent in the oppoſite direction. In both Eye-lids, they are awanting near the inner Angle.

The Cilia prevent duſt, inſects, &c. from getting into the Eye, aſſiſt in moderating the quantity of light ſent into it, and add to the beauty of the Face.

Glandula Lacrymalis.

The *Glandula Lacrymalis*, called, till of late years, the *Glandula Innominata* Galeni, is ſituated upon the upper and outer part of the Eye, in a hollow behind the outer end of the Superciliary Ridge of the Frontal Bone.—It is a Gland of the Conglomerate kind, of a yellowiſh colour, of an oblong form, and a little flattened, with one end pointing to the Noſe, the other to the outer angle of the Eye.

Beſides this, there is a chain of *Smaller Glands*, lying between the principal Gland and upper Eye-lid, and connecting them together.

In the direction of the Smaller Glands, there are ſeveral Excretory Ducts,—deſcribed by Dr Monro, 1758,—which run nearly parallel to, but do not communicate with each other.

The Excretory Ducts, on account of their ſmallneſs, are not often ſeen, and are difficult of injection. They terminate on the inner ſide of the upper Eye-lid, near the outer angle of the Eye, and upper edge of the Tarſus.

The *use* of this gland is to ſecrete the Tears, which are ſpread over the Surface of the Eye by their own weight, and by the motion of the Eye-lids, for the purpoſe of preſerving the delicacy of the Eye, and particularly the tranſparency of the Cornea.

PUNCTA LACRYMALIA.

The *Puncta Lacrymalia* are two ſmall Orifices placed near the inner angle of the Eye, one in the upper, the other in the under Eye-lid, at the extremity of the Tarſus, and oppoſite to each other.

Each Punctum is ſeated obliquely upon a ſmall eminence, and is ſurrounded with a Cartilaginous Circle, which keeps it conſtantly open.

The Puncta Lacrymalia are the Orifices of two ſmall Canals, which run in the direction of the edges of the Eye-lids towards the ſide of the Noſe, where they approach each other, and terminate together in the Lacrymal Sac.

The Tears which remain after moiſtening the Eye, are abſorbed by the Puncta, after the manner of Capillary attraction, and are conveyed through their Ducts into the Lacrymal Sac by the impulſe of the Eye-lids.

CARUNCULA LACRYMALIS.

The *Caruncula Lacrymalis* is a ſmall Gland of a reddiſh colour, of the Conglomerate kind, ſituated between the inner angle of the Eye-lids and Ball of the Eye, which ſupplies Sebaceous Matter to this part of the Eye-lids, and ſerves in particular to ſeparate the Puncta Lacrymalia, and to direct the Tears to them while the Eye-lids are ſhut.

Minute Hairs are found upon the Surface of this body, ſerving to entangle ſmall objects which get into the Eye.

VALVULA SEMILUNARIS.

The *Valvula Semilunaris* is a ſmall doubling of the Tunica Conjunctiva, which lies between the Caruncula Lacrymalis and Ball of the Eye.

It is larger in the Ape and other Quadrupeds than in the Human ſpecies, and ſtill larger in Birds, in which, as well as in Quadrupeds, it is called *Membrana Nictitans*.

It is in form of a Crefcent, the horns of which are turned towards the Puncta Lacrymalia, and affifts the Caruncula in conducting the Tears to the Puncta.

THE BALL OF THE EYE.

The *Ball*, *Globe*, or *Bulb* of the Eye, is of a fpherical form, to collect the rays of light into a proper Focus, and is furrounded behind by a quantity of foft Fat, to allow the Eye and its Mufcles to move with facility.

The Ball of the Eye is compofed of *Coats*, *Humours*, *Veffels*, and *Nerves*, to be next defcribed.

COATS.

Tunica Adnata.

The *Tunica Adnata*, or *Conjunctiva*, named from its connecting the Eye to the Orbit, is a reflection of the Skin continued from the Eye-lids over the whole fore-part of the Ball of the Eye.

It adheres flightly by means of Cellular Subftance to the White of the Eye, but fo firmly to the Cornea, as to be feparated from it with difficulty.

It is fo remarkably thin, that the colour of the fubjacent parts fhine readily through it.

Between this Coat and the white part of the Eye, there is a quantity of loofe Cellular Subftance, which is very Vafcular, and is the common feat of *Ophthalmia*.

The Tunica Adnata fupports the Ball of the Eye, prevents extraneous bodies from getting to the back-part of it, and forms a fmooth covering to leffen the friction between the Eye and Eye-lids.

Cornea.

The *Cornea*, fo called from its refemblance to Horn, is termed by many Authors *Cornea Lucida*, to diftinguifh it from the Sclerotica, named *Cornea Opaca*.

It forms the anterior Pellucid Covering of the Eye, is more convex than the reft of the Ball, and is joined to the Tunica Sclerotica, like the Segment of a fmall Sphere to that of a larger one. The convexity, however, varies in different perfons, fo as to form a fhort or long fighted Eye, according as the Cornea is more or lefs prominent.

In

In a recent ſubject, it is hard, denſe, and tranſparent; but after maceration in water, it becomes ſoft and opaque, and may be readily ſeparated, eſpecially in young Animals, into different Lamellæ, the anterior of which is the continuation of the Tunica Adnata.

By a ſlight degree of putrefaction, it may alſo be ſeparated from the Tunica Sclerotica.

In the Whale, the edge of the Cornea is received into a diſtinct Groove formed by the Sclerotica.

In a ſound ſtate, it has no Veſſels which carry red Blood, though ſuch are frequently ſeen on it when the Eye is inflamed.

Its nerves are too ſmall to be traced; yet it poſſeſſes exquiſite ſenſibility.

It collects the rays of light, and tranſmits them to the Eye, protects the tender parts within it, and contains the Aqueous Humour.

Iris.

The *Iris*, which is named from being in ſome perſons of different colours, is the only Coat which poſſeſſes motion. It was conſidered as a continuation of the Choroid Coat, until deſcribed by Zinn, who ſhews that it is only connected to this Coat by the medium of the Ciliary Circle.

It is placed at a little diſtance from the Cornea, begins a ſmall way behind the junction of that Coat with the Sclerotica, and running acroſs, it forms a Septum, a little convex anteriorly, and perforated in the middle by a Hole, called the Pupil, or ſight of the Eye.

The term *Pupil* is applied, becauſe it repreſents objects no larger than a Pupilla or Puppet.

In the Fœtus, the Pupil is covered with a Vaſcular Membrane, termed *Membrana Pupillaris*, which generally diſappears between the ſeventh and ninth month of geſtation.

Upon the back-part of the Iris, there is a dark-coloured Pigment, conſidered by the Ancients as a poſterior Layer of the Iris, called by them *Uvea*, from its reſemblance in colour to the Grape.

When the Paint is waſhed off, the Iris exhibits two ſets of Fibres,—concerning which Authors have entertained various opinions,—one in the form of Radii, the different

different colours of which give the diverſity of colour to the Eye; the other circular, and ſurrounding the inner edge of the Iris, and conſidered by Dr Monro as the Sphincter Muſcle of the Pupil.

The Iris has alſo many Blood-veſſels, which can be readily injected; and has a greater proportion of Nerves than almoſt any other part of the Body.

It floats in the Aqueous Humour, and is of ſuch a nature, that upon expoſure to a ſtrong light, or when the Eye looks upon a near object, the diameter of the Pupil is diminiſhed; and vice verſa.

The different motions of the Iris are ſuppoſed to be excited by the ſenſibility of the Retina, and the quantity of light falling upon that Nerve.

The Iris ſerves to regulate the quantity of light ſent to the bottom of the Eye.

Tunica Sclerotica.

The *Tunica Sclerotica*, which is named from its hardneſs, is the largeſt and ſtrongeſt Coat of the Eye, covering the whole Ball, excepting the parts occupied by the entrance of the Optic Nerve behind, and by the Cornea before.

It is ſo firmly fixed to the edge of the Cornea, as to have been conſidered by many Anatomiſts as a continuation of the ſame ſubſtance; but it differs from the Cornea in the following particulars; it is of a pure white colour, is formed of Fibres running in every direction, and cloſely interwoven with each other, is not diviſible into Layers, and may be ſeparated from it by art, as has been already mentioned.

It is thickeſt poſteriorly, and receives a little tinge on the inner Surface, from the Choroid Coat, with which it is in contact.

It gives form and ſtrength to the Eye, and ſupports the tender parts within it.

The Tendons of the four Recti Muſcles of the Eye are fixed to the fore-part of the Tunica Sclerotica; and theſe, or the Cellular Vaginæ covering them, have been ſuppoſed to give an additional whiteneſs to the Eye; and the part giving this whiteneſs has been termed *Tunica Albuginea*:—But the Sclerotic Coat is every where of a pure white, and can receive little additional brightneſs from any ſuch coverings.

Tunica Choroides.

This Coat derives its name from the Veſſels with which it abounds, forming a *Chorus;* or from its ſuppoſed reſemblance to the Membrane called *Chorion,* which ſurrounds the Fœtus in Utero.

The *Choroides* lies under the *Sclerotica,* and is connected to it by the Trunks of Veſſels and Nerves which paſs from the one Coat to the other, and alſo by a tender Cellular Subſtance, of a brown colour, with which the inner Surface of the Sclerotica is tinged.

It begins at the entrance of the Optic Nerve into the Eye, runs between the Sclerotica and Retina, nearly to the Cryſtalline Lens, where it is more firmly connected to the Sclerotic Coat than it is elſewhere, by means of the Ciliary Circle.

The *Ciliary Circle,* or *Ciliary Ligament* as it is called, is compoſed of a quantity of condenſed ſhining Cellular Subſtance, which forms a white Ring connecting the fore-part of the Choroides, and the root or outer Margin of the Iris, to the Sclerotica.

The Choroid Coat is much thinner and more tender than the Sclerotic, and is one of the moſt Vaſcular parts of the Body, ſeeming at firſt ſight to be entirely compoſed of Veſſels.—The greater number of thoſe on the outſide run in whirls; while thoſe on the inſide, running nearly parallel to each other, gave riſe to the ſuppoſed exiſtence of the *Membrana Ruyſchiana.*

It is alſo furniſhed with numerous Nerves, which are united with its Veſſels by a fine Cellular Texture.

In the human Eye, the Choroides is of a duſky brown colour, both externally and internally; but the colour varies conſiderably in the eyes of different animals.

The inner Surface of this Coat, which is *Villous,* was deſcribed by Ruysch as a *diſtinct Lamina,* and has been termed by many Anatomiſts *Tunica Ruyſchiana;*—Haller however, and Zinn, and many others who followed them, have demonſtrated this Coat to conſiſt of only one Lamina; though in Sheep, and in ſome other animals, it appears to be double.

Upon the inner ſide of the Choroides, there is a dark-coloured Mucus, called *Pigmentum Nigrum,*—ſuppoſed to be produced from the Veſſels of this Coat,—which is blackeſt and thickeſt at the fore-part of the Eye, where it adheres ſo tenaciouſly as to be removed with difficulty;

culty; but behind it is thinner, more fluid, and more eaſily removed; becoming gradually leſs evident, and almoſt diſappearing round the Optic Nerve.

In advanced age, the Pigmentum Nigrum becomes more diluted, and of a lighter colour; ſo that the Veſſels of the Choroid Coat may be ſeen ſhining through the Vitreous Humour.

Though HALLER denies that the *Membrana Ruyſchiana* can ever be ſeparated, in the Human Eye, from the Choroides,—he retains the name, to denote the black Surface of this Coat.

In grameniverous animals, in fiſhes, and in thoſe animals which go in queſt of prey in the night, the Paint is of a light and ſhining colour in the bottom of the Eye, and is called *Tapetum.*—In an entirely white Rabbit, the Paint is awanting, and the Eye has a red colour from the Veſſels of the Choroid Coat; but the redneſs diſappears when the animal is dead.

At the fore-part of the Choroid Coat, and oppoſite to the Ciliary Circle, there is a black radiated Ring, called *Corpus Ciliare*, which is about the ſixth part of an inch in breadth towards the Temple, but ſomewhat narrower towards the Noſe.

In the poſterior portion of the Corpus Ciliare, there are numerous pale radiated *Ciliary Striæ*, but ſo covered with the Pigmentum Nigrum, as not to be diſtinctly ſeen till the Paint is removed.

Near the connection of the Corpus Ciliare with the root of the Iris, theſe Striæ become gradually broader and more elevated, and form about ſeventy white *Plicæ* or *Folds*, termed *Proceſſus Ciliares*, the intervals of which are alſo covered with Pigmentum Nigrum.

The *Proceſſus Ciliares*, which obtain their name from their reſemblance to the Cilia of the Eye-lids, are commonly formed each of two or more Striæ, are not all of an equal ſize, and many of them forked at their extremities.

The Corpus Ciliare, formed of the Ciliary Striæ and Ciliary Proceſſes, has no appearance of Muſcularity, though the contrary has been ſuppoſed by ſome Authors. A fine Injection ſhews it to be chiefly formed of a continuation of the Blood-veſſels of the Choroid coat, the branches of which divide into ſuch minute parts, as to give the whole a Villous appearance.

The Corpus Ciliare is glued to the Retina, at the fore-

fore-part of the Vitreous Humour, and a little behind the edge of the Cryſtalline Lens; but the Ciliary Proceſſes float in the Aqueous Humour in the poſterior chamber of the Eye, at the inner ſide of the root of the Iris, and may be readily turned back behind the edge of the Lens, to which they are contiguous, but do not adhere.

The Choroid Coat, with its dark Paint, ſerves to ſuffocate the rays of light which paſs through the Retina, and thereby to allow a diſtinct image to be formed upon the bottom of the Eye, and to prevent the rays from being reflected ſo as to form a ſecond image.

In theſe animals in which this Coat or its Paint is of a bright colour, it acts as a mirror to reflect light, and make the impreſſion ſtronger.

Optic Nerve and Retina.

The *Optic Nerve*, in its paſſage through the Orbit, is covered by a continuation of the Membranes which ſurround the Brain.

At the Foramen Opticum, the *Dura Mater* is divided into *two Laminæ*, one of which aſſiſts in forming the Perioſteum of the Orbit; the other, which is again divided into two Laminæ, furniſhes a ſheath to the Nerve, and accompanies it to the Tunica Sclerotica, to which it is ſo firmly connected by Cellular Subſtance, as to have induced ſome Authors to deſcribe the Sclerotica as a continuation of the Dura Mater.

The body of the Nerve is ſtill more cloſely inveſted by the *Pia Mater*, which alſo forms ſheaths round the Nervous Faſciculi, and accompanies the Nerve into the Eye.

At the back-part of the Ball of the Eye, and a little removed from the Axis, towards the Noſe, the *Faſciculi* of the Optic Nerve paſs through a Cribriform part of the Sclerotic Coat.

The Nerve is contracted at its entrance through the Sclerotic Coat, but immediately after its ingreſs, it expands to form the Retina,—ſo called from its ſuppoſed Reticular appearance.

In the middle of the entrance of the Optic Nerve, the Artery is ſeen dividing into branches, which are diſperſed upon the inner Surface of the Retina.

The Retina advances between the Choroid Coat and

Capſule

Capſule of the Vitreous Humour, to the fore-part of the Eye, and terminates or diſappears upon the anterior part of the edge, or greateſt diameter of the Capſule of the Cryſtalline Lens.

The Retina is contiguous to the Choroid Coat and Capſule of the Vitreous Humour, but does not adhere to either, by Blood-veſſels or otherwiſe, till it reach the Corpus Ciliare.

Under the Corpus Ciliare, the Retina is ſo covered externally, with the Pigmentum Nigrum, and adheres internally ſo cloſely to the Capſule of the Vitreous Humour, as to be prevented from being ſeen till the black Paint be waſhed off, or till all the Coats be removed poſteriorly, and the Eye viewed through the medium of the Vitreous Humour.

The Retina is compoſed of a tender and Pulpy-like Subſtance, is ſemitranſparent, and of a light-gray colour, reſembling that of ground glaſs.

From the entrance of the Optic Nerve, to the edge of the Corpus Ciliare, the Retina is of an equal and uniform Subſtance, and is ſo eaſily torn and ſeparated from the edge of that body, as to be deſcribed by many Authors as terminating there.

Under the Striæ and Proceſſes of the Corpus Ciliare, the Retina is thinner than in the poſterior part of the Eye, and is ſo impreſſed by theſe bodies, as alſo to have the appearance of Striæ, which terminate in numerous minute Fibres, like Nerves in other parts of the Body.

The Retina is the ſeat of Viſion, and therefore the primary part of the Eye, to which all the other parts within the Orbit are ſubſervient.

HUMOURS.

Aqueous Humour.

The *Aqueous Humour* is lodged in the ſpace between the Cornea and Cryſtalline Lens.

This ſpace is divided into two Cavities, called *Chambers*, the anterior of which is ſituated between the Cornea and Iris, and is the larger of the two.

The poſterior is placed between the Iris and Cryſtalline Lens, and is ſo much ſmaller than the former, that its exiſtence has been denied by ſome Authors, though it is a diſtinct Cavity, demonſtrable, not only in the Adult,

dult, where the Pupil is open, but in the Fœtus before the Pupil is formed.

The Aqueous Humour is clear as the pureſt Water, but is ſomewhat heavier, poſſeſſes a ſmall degree of viſcidity, contains a little Salt, and is about five grains in weight.

In the Fœtus, and for the firſt month after birth, it is reddiſh and turbid.

When evacuated, it is quickly renewed; for within forty-eight hours after it has been let out by a puncture, the Cornea is obſerved to be again perfectly diſtended.

It is ſuppoſed to be ſecreted from the neighbouring Arteries, particularly from thoſe on the fore-part of the Iris and Ciliary Proceſſes.

It ſerves to keep the Cornea diſtended, and, by its roundiſh form and pellucidity, it collects and tranſmits the rays of light to the inner parts of the Eye. It likewiſe guards the Iris and Lens, and admits of the motions of the former.

Crystalline Lens.

The *Cryſtalline Lens*, which has its name from its reſemblance to Cryſtal, and from its Lenticular form,—though a ſolid body, which may be moulded into various ſhapes,—has always been claſſed among the Humours of the Eye.

It is ſituated behind the Aqueous Humour, oppoſite to the Pupil, and the whole of its poſterior part is received into a depreſſion on the fore-part of the Vitreous Humour.

Like a common Lens, or magnifying Glaſs, it has two convex Surfaces, the anterior of which is in general leſs convex than the poſterior, the two being formed of ſegments of ſpheres of an unequal ſize.

The anterior Surface, according to the experiments of Petit, forms the ſegment of a ſphere, the diameter of which is between ſeven or eight lines, or twelfths of an inch; while the poſterior Surface is only equal to the ſegment of a ſphere of about five lines in diameter.

It has been obſerved by Zinn,—that the figure of the Lens varies at different periods, being in the Fœtus almoſt of a ſpherical form, but becoming gradually flatter on the anterior and poſterior Surfaces, till about the age of thirty, after which its form does not appear to vary.

As

As the figure, so also the colour and consistency are found to change at different times of life.—In the Fœtus, not only the Capsule, but the Lens also is of a reddish colour; but, immediately after birth, they become perfectly transparent.—In a person considerably advanced in years, the Lens is observed to acquire a certain degree of yellowness, which appears first in the centre, and afterwards extends gradually to the circumference; and in extreme old age, this yellow tinge becomes so deep as to resemble Amber.

An Aqueous Fluid is described as being situated between the Crystalline Lamellæ, which is supposed to decrease in quantity, and to become yellowish, the Lens at the same time increasing in solidity as the person advances in life.—This difference however, of convexity, colour, and consistence, according to the difference of age, is not uniformly met with.

The Lens becomes opaque soon after death, and acquires an additional opacity when put into spirit of wine.

It is composed of concentric Lamellæ, laid over each other like the coats of an Onion. These Lamellæ are connected by a fine Cellular Substance, and are more closely compacted the nearer they are to the centre.

This lamellated structure may be readily observed in the Eye of an Ox, or any other large animal, but is most evident when the Lens has been macerated in Water or Vinegar.

When the maceration is continued for some time, the Lamellæ put on a radiated appearance, the Radii running in a vertical manner, or issuing from the centre to the circumference, dividing the Surface into Isoscular Triangles.

The Lamellæ were discovered by LEUWENHOECK, to be of a Fibrous structure. By a late writer, these Fibres have been considered as Muscular,—but this opinion of the Muscularity of the Lens, seems to have gained very few proselytes.

The substance of the Lens somewhat resembles half-melted Gum, is very soft and tender on the outside, but becomes gradually firmer and tougher towards the centre, where it forms a Nucleus.

The Lens is surrounded by a very pellucid proper Capsule, called *Tunica Aranea*, or *Crystallina*, which is much thicker and more elastic than the Capsule of the Vitreous Humour, but adheres so slightly, and is so easily

fily lacerated, that after a fmall puncture is made in it, the Lens ftarts out, upon applying gentle preffure to the Capfule.

The pofterior part of the Capfule is much thinner, fofter, and weaker than the anterior; but is quite a *diftinct Membrane* from the Tunica Vitrea; yet fo firmly connected to it by Cellular Subftance, that it is difficult to feparate them without lacerating both the Vitreous Coat and its Humour.

Some Authors defcribe an *Aqueous Humour* as feated between the Lens and its Capfule; while others, of no fmall refpectability, deny the exiftence of this Humour, as well as of that which is faid to be fituated between the Lamellæ of the Lens.

The *Veffels* of the Lens are not to be feen in the Eye of an Adult; but in that of a Fœtus, PETIT found Veffels paffing from the Corpus Ciliare, over the fore part of the Capfule of the Lens.

WINSLOW afterwards obferved, that in the Fœtus, and in new-born children, a fine injection fucceeded fo well as to difcover the Veffels of the Membrana Cryftallina and Vitrea;—and in a Fœtus of about fix months, the injected liquor feemed to him to have penetrated a part of the Cryftalline and Vitreous Humours.

ALBINUS derives thefe Veffels from a double fource.—In the Eye of a Whale, he demonftrated Veffels paffing from the Ciliary Proceffes to the Subftance of the Lens;—and, at a later period, he injected in the human Eye, a fmall branch arifing from the Central Artery of the Retina, which proceeded in a ftraight direction through the Vitreous Humour, and divided in the pofterior part of the Capfule into numerous branches, many twigs of which plunged into the Subftance of the Lens.

This artery and its branches have been frequently and fuccefsfully injected by fucceeding Anatomifts.

VITREOUS HUMOUR.

The *Vitreous Humour*, fo called from its refemblance to melted Glafs, is fituated in the back-part of the Cavity of the Eye, which it occupies from the infertion of the Optic Nerve to the Surface of the Cryftalline Lens.

It is round at the back-part and fides, where it is covered by the Retina, but is concave before, where it forms a bed for the Cryftalline Lens.

It

It is by much the largeſt of the three Humours, occupying upwards of nine-tenths of the whole Eye, and has a Gelatinous appearance,—or is ſomewhat like the glaire of an Egg.

In an Adult it is always very tranſparent, and in an Old Perſon it does not, like the Lens, degenerate into a yellow, or any other colour.

In the Fœtus, like the Aqueous Humour, it is of a reddiſh colour.

The liquor with which the Vitreous Humour is filled, is ſimilar to the Aqueous,—very fluid, tranſpires readily through the Capſule, though that Coat be entire, and, like the Aqueous Humour, is ſomewhat thicker, heavier, and more viſcid than Water.

When this Humour is evacuated by puncture, in the living Body, it is very ſeldom, though ſometimes renewed.

Upon the Surface of this Humour there is a Coat, termed *Vitrea*, as tranſparent as the Humour itſelf, and ſo thin and Cobweb-like, as to have the name of *Aranea.*

The *Tunica Vitrea* is remarkably ſmooth on its outer Surface; but within it ſends Proceſſes into the body of the Humour.

Some Authors, and among theſe WINSLOW, have deſcribed this Coat as conſiſting of two Laminæ, but SABATIER, and other late writers, ſeem ſufficiently ſatisfied that it is a ſingle Layer; and even this ſingle Layer cannot be raiſed but with difficulty, though it is demonſtrable by making a puncture to allow the Humour to eſcape, and by afterwards diſtending the part with air.

The ſtructure of the Humour conſiſts in a ſet of delicate Cells, which contain the liquor within them, as may be ſeen by the aſſiſtance of Acids, or by boiling Water, or by Congelation.

The Cells of the Humour communicate freely with each other, as appears from the liquor oozing out by the ſmalleſt puncture made in the general Capſule.

Under the Corpus Ciliare, the Capſule of the Vitreous Humour ſends off an external Lamina, which accompanies the Retina, and is inſerted with it into the fore-part of the Capſule of the Lens, a little before its anterior edge. It is termed *Membranula Coronæ Ciliaris*, or *Zonula Ciliaris*, from its Striated appearance and Circular form, and aſſiſts in fixing the Lens to the Vitreous Humour.

After

After ſending off the Ciliary Zone, the Coat of the Vitreous Humour goes behind the Capſule of the Lens, to which it firmly adheres.

Between the Ciliary Zone and part where the Capſule of the Vitreous Humour adheres to that of the Lens,—which is at the ſame diſtance behind the edge of the Lens with the diſtance of the inſertion of the Ciliary Zone before it,—a Paſſage is formed, named *Canalis Petitianus*, after PETIT, who diſcovered it.

The Membranes forming this Paſſage are pervaded by tranſverſe Fibres, in ſuch a manner, that when air is introduced, it goes freely round the edge of the Lens; but the Paſſage has a Cellular appearance, being contracted and dilated alternately.

The Canal of PETIT is nearly of the ſame breadth with the Corpus Ciliare, is always empty, and has no communication with the Capſules of the Vitreous or Cryſtalline Humours.

No Veſſels are to be ſeen in the Vitreous Humour of an Adult, but in the Eye of a Fœtus, an Artery is obſerved to ariſe from the central one of the Retina, which paſſes through the middle of the Vitreous Humour, ſending twigs to the Cellular Texture of this Humour, while the principal Trunk is continued to the Capſule of the Cryſtalline Lens, as has been already obſerved.

The Vitreous Humour ſerves to give ſhape to the Eye, to keep the Coats properly expanded, to preſerve the due diſtance of the Lens, and direct the rays of light to the Retina.

MUSCLES OF THE BALL OF THE EYE.

The Ball of the Eye is moved by *ſix Muſcles*, which are divided, on account of their direction, into *four ſtraight* and *two oblique* Muſcles, obtaining their reſpective names from their ſize, ſituation, direction, or uſe.

Of the ſtraight Muſcles, one is ſituated above the Eye, another below it, and one on each ſide. Of the oblique, one is placed at the upper and inner, and the other at the under and outer part of the Eye.

The *Recti* Muſcles are not ſtraight, as the name implies; for, on account of the ſituation of the Eye and ſhape of the Orbit, the internal, or that next the Noſe, is the only one which runs in a ſtraight direction.

Neither are they all equally long, the internal being the

the ſhorteſt, the external the longeſt, and the other two nearly of the ſame length.

The four ſtraight Muſcles, which bear a ſtrong reſemblance to each other, ariſe by a narrow beginning, a little Tendinous aud Fleſhy, from the edge of the Foramen Opticum, where they embrace the Optic Nerve at its entrance into the Orbit.

In their paſſage forwards, they form Fleſhy Bellies, which ſend off broad and very thin Tendons, to be inſerted into the Sclerotic Coat, under the Tunica Adnata, about a quarter of an inch behind the edge of the Cornea, and at equal diſtances from each other.

At the place of their inſertion they are ſo intimately connected with the Sclerotica, that they cannot be ſeparated from it, or be brought as far as the Cornea, without evident laceration.

The different Muſcles of the Ball of the Eye, where they lie upon the Ball, are covered with a Cellular Sheath, which afterwards degenerates into that Cellular Subſtance which is interpoſed between the Sclerotica and Conjunctiva.

Levator Oculi;

Or *Rectus Attollens*, or *Superbus.*

Origin: From the upper part of the Foramen Opticum, below the Levator Palpebræ Superioris.

Inſertion: Into the upper and fore part of the Tunica Sclerotica.

Action: To raiſe the fore-part of the Ball of the Eye.

Depressor Oculi;

Or *Rectus Deprimens*, or *Humilis.*

Origin: From the inferior part of the Foramen Opticum.

Inſertion: Oppoſite to the former.

Action: To pull the fore-part of the Eye downwards.

Adductor Oculi;

Or *Rectus Adducens*, or *Bibitorius.*

Origin: From the Foramen Opticum, between the Obliquus Superior and Depreſſor.

Inſertion: Oppoſite to the inner angle.

Action: To turn the fore-part of the Eye towards the Noſe.

Abductor Oculi;

Or *Rectus Abducens*, or *Indignabundus*.

Origin: From the Bony Partition between the Foramen Opticum and Lacerum.

Infertion: Into the Ball of the Eye, oppofite to the outer Angle.

Action: To turn the fore-part of the Eye towards the Temple.

When two of the oppofite Recti Mufcles, or all of them act together, they draw the Eye into the Orbit.

When two of the adjacent Recti Mufcles act, they turn the fore-part of the Eye obliquely in a direction towards their Origins.

Obliquus Superior;

Or *Obliquus Major*, or *Trochlearis*.

Origin: Like the ftraight Mufcles, from the edge of the Foramen Opticum, between the Levator and Adductor Oculi. From thence it runs ftraight forwards, fends off a long round Tendon, which paffes through a Cartilaginous Pulley fixed behind the Internal Angular Procefs of the Os Frontis: From this it runs a little downwards, and returns backwards and outwards, paffing under the Levator Oculi, to have its

Infertion, By a Broad thin Tendon, into the Tunica Sclerotica, about half-way between the infertion of the Levator Oculi and entrance of the Optic Nerve.

Action: To roll the Ball of the Eye, by turning the Pupil downwards and outwards.

Obliquus Inferior;

Or *Obliquus Minor*.

Origin: By a narrow beginning, from the anterior edge of the Orbitary Procefs of the Superior Maxillary Bone, near the Lacrymal Groove, from which it paffes obliquely outwards, backwards, and upwards, round the Ball of the Eye.

Infertion: By a Broad thin Tendon, into the Sclerotic Coat, between the entrance of the Optic Nerve and infertion of the Abductor Oculi, and oppofite to the infertion of the Superior Oblique Mufcle.

Action: To roll the Ball of the Eye, by turning the

Pupil

Pupil upwards and inwards, and, with the aſſiſtance of the Superior Oblique Muſcle, to pull the Eye forwards, thereby becoming an antagoniſt to the Recti Muſcles.

The two Oblique Muſcles, on account of rolling the Eye, and aſſiſting it in the expreſſion of certain paſſions, have been called *Rotatores*, or *Amatores*.

VESSELS OF THE EYE.

The *Frontal*, *Faſcial*, and *Temporal Arteries*, which are branches of the External and Internal Carotids, ſupply the Palpebræ, and communicate with thoſe which are diſperſed within the Orbit.

Some ſmall branches of the *Internal Maxillary Artery* paſs through the Inferior Orbitar Fiſſure, to be diſperſed chiefly upon the Perioſteum of the Orbit and Fat of the Eye.

The *Ocular Artery*, which is a branch of the Internal Carotid, paſſes through the Foramen Opticum, in company with the Optic Nerve, and ſupplies the Fat, Muſcles, and Ball of the Eye, and alſo the Lacrymal Gland and Tunica Conjunctiva.

The branches which belong to the Ball of the Eye, have the name of *Ciliares* :—They perforate the Sclerotica in different places, and are afterwards diſperſed chiefly upon the Choroid Coat and Iris.

One branch of the Ocular Artery, called *Centralis Retinæ*, perforates the Optic Nerve, and is diſperſed upon the Retina.

The *Veins* which correſpond with the Arteries of the Eye, communicate freely with each other, and paſs partly to the External Jugular Vein, by branches ſituated about the fore-part of the Orbit, and partly to the Internal Jugular Vein, by the Cavernous Sinus.

NERVES OF THE EYE.

Beſides the *Optic Nerve*, already taken notice of, the Eye receives the Third and Fourth Pairs, and branches from the firſt part of the Fifth Pair, together with the Sixth Pair, and branches from the Seventh.

The parts about the fore-ſide of the Orbit are ſupplied by branches from the Fifth and Seventh Pairs ;—the Ball of the Eye by Nerves called *Ciliary*, which come from the Third and Fifth Pairs ;—the Fat, Muſcles, Lacry-

mal

mal Gland, &c. are ſupplied by the Third, Fourth, Fifth, and Sixth Pairs.

The *uſe* of the Eye is, to receive and collect the rays of light, in ſuch a manner as to form upon the Retina the image or picture of the object which the Eye looks at; and the point where theſe different rays meet is called the *Focus*.

The object is painted upon the Retina in an *Inverted* manner, the rays from above falling upon its under, and thoſe from below upon its upper part; and it is ſuppoſed to be by habit, or rather by inſtinct, that we judge of the *real* ſituation of any object.

That the rays of light may terminate diſtinctly on the Retina, it is neceſſary that both the Cornea and Cryſtalline Lens ſhould have a certain degree of convexity.

If either the one or the other be too prominent, the Focus will be formed before it reach the Retina, as is the caſe in ſhort-ſighted people, who require concave glaſſes to enable them to ſee objects diſtinctly, at the proper and ordinary diſtance.

If, on the contrary, the Cornea or Lens be too flat, or the refractive power of the Humours be in any way diminiſhed, the Focus will then be imperfectly formed, till the object is viewed at a greater diſtance than ordinary, as is the caſe with perſons advanced in life, to whom the aſſiſtance of convex glaſſes becomes neceſſary.

How an object, viewed with both Eyes, appears ſingle, has been aſcribed by the generality of Authors to cuſtom and habit; and by others to inſtinct, which regulates the uniform motion of the Eye, and the accurate application of both to one point.

The Eye is enabled to judge of, or accommodate itſelf to objects at different diſtances, by the action of its Muſcles increaſing or diminiſhing the length of its Axis, and by the motions of the Iris allowing a greater or ſmaller quantity of light to be thrown into the Eye.

OF

OF THE NOSE.

The *Nose*, which is the Organ of Smell, and contributes to the general purpose of Respiration, is divided into the External Prominent Part, and the Internal Cavity, which is separated by the Septum Narium into two smaller Cavities;—or, it is divided into Hard and Soft parts.

The External part, or Nose, properly so called, is composed superiorly of Bones, inferiorly of Cartilages, and has a partial covering from the Muscles, and a general one from the common Integuments.

On the outside of the Nose are observed,—the *Radix*, or upper part;—the *Dorsum*, or middle prominence;—the *Apex*, or point;—the *Alæ*, or lateral moveable parts; —and *Columna*, or under part of the Partition next the Upper Lip.

The Osseous part of the Nose is formed by the *Ossa Nasi*, properly so called, the *Ossa Maxillaria*, and *Os Frontis*, which constitute the upper and fore part:

By the *Os Ethmoides* and *Ossa Unguis*, which form the upper, inner, and lateral parts:

And by the *Ossa Maxillaria Superioria*, *Ossa Palati*, *Os Sphenoides*, *Ossa Spongiosa Inferiora*, and *Vomer*, which form the under, inner, and back part.

The *two Cavities*, or *Nostrils*, terminate anteriorly in the Face, and posteriorly in the Fauces, and are much enlarged by the different Sinuses which communicate with them.

The under and fore part of the Nose consists of *five Cartilages*, of a somewhat regular figure, and of some smaller pieces, which are more irregular, and of an indeterminate number.

Of the five Cartilages, one is situated in the middle, and the other four laterally.

The middle Cartilage is the most considerable, and supports the rest: It constitutes the Cartilaginous part of the Septum Narium, and is joined to the anterior edge of the Nasal Lamella of the Ethmoid Bone, to the anterior

anterior edge of the Vomer, and to the fore-part of the Spinous Procefs of the Superior Maxillary Bones.

Of the lateral Cartilages, two are placed anteriorly, forming by their curved union the Tip of the Nofe; and two pofteriorly, which form the Alæ Nafi.

Between the anterior and pofterior Cartilages, are fpaces filled with additional Cartilages, the number, fize, and figure, varying in different bodies.

The elafticity of the Cartilages contributes to the defence of the Nofe againft external injuries.

The Nofe is covered by the common Integuments, and perforated at its under and outer part by the Ducts of Sebaceous Glands, the contents of which may be readily fqueezed out by the preffure of the Fingers.

The Cartilages of the Nofe are moved in different directions, by the following Mufcles, which have been already defcribed, viz. the *Compreffor Narium*, the *Nafal* part of the *Frontal* Mufcle, the *Levator* and *Depreffor Labii Superioris Alæqui Nafi*.—The Nofe may alfo be moved by the neighbouring Mufcles, which, in many inftances, become affiftants to the others.

The internal Nares or Cavities of the Nofe extend upwards to the Cribriform Plate of the Ethmoid, and to the Body of the Sphenoid Bone.

At the inner fide they are bounded by the Septum Narium, which is formed by the Nafal Lamella of the Ethmoid Bone, by the Vomer, and by the middle Cartilage of the Nofe.

On the outfide, or that next the Cheek, the Offa Spongiofa project a confiderable way into their Cavities, and increafe the Surface of the Membrane of the Nofe, for enlarging the Organ of Smell.

In animals which fmell acutely, the Offa Spongiofa are remarkably large and complex.

The bottom of the Noftrils runs directly backwards, fo that a ftraight probe may be paffed through either of them to the Throat.

In the fore-part of the Noftrils there are ftiff Hairs, called *Vibriffæ*, which prevent the Mucus from conftantly flowing out, and infects, or other extraneous matter, from entering.

The general Cavity of each Noftril is divided by the Offa Spongiofa into *three Meatus*, or *Paffages*, which run from before backwards, and are defcribed by HALLER according to their fituations, viz.

The

The *Meatus Narium Superior*, placed at the upper, inner, and back-part of the Superior Spongy Bone.

The *Meatus Medius*, ſituated between the Superior and Inferior Spongy Bones.

The *Meatus Inferior*, ſituated between the Inferior Spongy Bone and bottom of the Noſe.

The inſide of the Noſe is lined with a thick Spongy *Membrane*, termed *Mucoſa*, or *Pituitaria* of SCHNEIDER, or *Schneideriana*, which lines the whole internal Nares, and is alſo continued to the different Sinuſes, to the Lacrymal Sacs and Palatine Ducts, to the Pharynx, Palate, and Euſtachian Tubes.

This Membrane is very *Vaſcular* and *Nervous*, and is the primary Organ of Smelling. It is conſtantly lubricated and preſerved in a proper degree of moiſture by the *Mucus* of the Noſe, which is diſcharged upon its Surface from numerous ſmall Follicles.

The different *Sinuſes* of the Bones of the Head, after having run obliquely backwards in a ſhort winding direction, terminate by ſmall openings in the Cavity of the Noſe.

The *Frontal Sinuſes* paſs downwards into the anterior Ethmoid Cells, which terminate in the upper part of the Noſe, behind the beginning of the Lacrymal Sacs.

Beſides the Paſſages common to the Frontal Sinuſes and anterior Ethmoid Cells, there are others proper to the Poſterior Ethmoid Cells, which terminate in the upper and back-part of the Noſe, near the openings of the Sphenoid Sinuſes.

The *Sphenoid Sinuſes* open, behind the Cells of the Ethmoid Bone, into the upper and back-part of the Noſe.

The *Maxillary Sinuſes* open at their upper and inner ſides, by one, and ſometimes two paſſages, into the middle of the ſpace between the Superior and Inferior Spongy Bones, nearly oppoſite to the under edge of the Orbits.

At the upper part of the Maxillary Sinuſes, *Appendices*, deſcribed by HALLER, are ſometimes found, which communicate with the Ethmoid Cells.

The Sides, or Walls of the Maxillary Sinuſes, are formed of thin Plates of Bone, excepting where the Proceſſes project and give them additional ſtrength. Below, they have only thin Plates between them and the Dentes

 Molares,

Molares, the roots of which are ſometimes found to perforate the Septum.

The different Sinuſes are lined with a continuation of the *Membrana Schneideriana*; but in theſe it is thinner, leſs Vaſcular and Nervous, than that part of the Membrane which lines the general Cavity of the Noſe.

They are conſtantly moiſtened, but not filled with a fluid.

The Sinuſes increaſe and modulate the voice: Their hollow ſtructure renders the Bones lighter; but they do not appear to conſtitute part of the Organ of Smell.

Their paſſages being directed backwards, prevent any kind of extraneous matter from getting into them.

The *Lacrymal Sac* is a Membranous Canal, ſituated in the Lacrymal Groove, formed by the Superior, Maxillary, Lacrymal, and Inferior Spongy Bones.

The *Oſſeous Duct*, in its deſcent, runs a little obliquely backwards to the lower and lateral part of the Cavity of the Noſe, where it terminates at the inner and forepart of the Antrum Maxillare, under the Os Spongioſum Inferius, a little behind the anterior extremity of that Bone, and in a direct line upwards from the ſecond Dens Molaris.

The upper part of the Oſſeous Paſſage forms only a ſemi-canal, the under end a complete one.

The Lacrymal Sac is ſituated in the upper part of the Lacrymal Groove, behind the Tendon of the Orbicularis Muſcle of the Eye-lids. About a fourth part of the Sac is ſituated above the Tendon, forming a kind of *Inteſtinum Cæcum*, and the reſt is placed below.

Towards the inner angle of the Eye, behind the Tendon of the Orbicularis Muſcle, the Sac is perforated by the Lacrymal Ducts.

The under part of the Sac becoming a little narrower, but without forming any Valve, paſſes into the Noſe, under the name of *Lacrymal Duct, Canalis Naſalis*, or *Ductus ad Naſum*, and terminates at the inferior extremity of the Oſſeous Canal.

The ſubſtance of the Lacrymal Sac and Duct is ſimilar to that of the *Membrana Schneideriana*, is defended with the ſame kind of Mucus with which this Membrane is lubricated, and is firmly connected to the Perioſteum of the Oſſeous Canal.

The *uſe* of this paſſage is,—to convey the ſuperfluous

Tears

Tears to the Nofe, fo as to prevent them from paffing over the Cheek.

The *Ductus Incifivus*, or *Nafalo-Palatinus* of STENO, is a fmall Canal, which, as has been already obferved in the defcription of the Bones, is only fometimes met with in the Human Body, though it is always to be found in the Ox, Horfe, Sheep, &c.

When prefent, it takes its origin from a fmall Pit, formed in the fore-part of the bottom of the Noftril, under the termination of the Lacrymal Duct. It runs obliquely downwards and forwards, placed in fuch a manner as to receive and conduct Tears into the Mouth.

The *Arteries* of the Nofe come chiefly from the external Carotids.

Thofe of the outer part of the Nofe come from the Facial and Internal Maxillary Arteries;—thofe of the inner, from the Maxillares Internæ;—and a few twigs are furnifhed by the Ocular Arteries.

The *Veins* go to the External Jugulars;—they likewife communicate with the Ocular veins, and of courfe with the Lateral Sinufes and Internal Jugulars.

The *Nerves* with which the outer part of the Nofe is chiefly fupplied, come from the fecond branch of the Fifth, and from the Portio Dura of the Seventh Pair.

The inner part is principally fupplied by the Firft, or Olfactory Nerves, and by fome branches from the firft and fecond portions of the Fifth Pair.

OF THE EAR.

The Ear, or Organ of Hearing, is divided into the *External* and *Internal Ear*.

EXTERNAL EAR.

The *External Ear* comprehends the *Auricle*, or *Ear*, properly ſo called, and the *Meatus Auditorius Externus*.

It is again divided into the *Pinna*, or *Ala*, which conſtitutes by much the greater part of it;—and *Lobus*, which is placed at its under end.

The *Pinna* or *Ala*, is chiefly compoſed of Cartilage, and is divided, at its fore-part, into ſeveral *Eminences* and *Cavities*, which have obtained particular names, viz.

The *Helix*, or outer Bar, or Margin, ſo called from its winding direction. It ariſes behind at the Lobe of the Ear, ſurrounds its upper edge, and terminates below, nearly oppoſite to its origin, dividing the Concha into two parts.

The *Antihelix*, *Anthelix*, or inner Bar or Margin, which is ſituated within the former, and is compoſed ſuperiorly of two Ridges, uniting together below.

The *Tragus*, ſo called from the Hairs which frequently grow from it having a reſemblance to the beard of a Goat.

It is a ſmall Eminence which lies over the Meatus Externus, and is connected to the under and fore-part of the Helix.

The *Antitragus*, ſo named from its being oppoſite to the Tragus, below the poſterior extremity of the Antihelix.

The *Cavitas Innominata*, ſituated between the Helix and Antihelix.

The *Scapha*, or *Foſſa Navicularis*,—compared in ſhape to that of a Boat,—ſituated between the two limbs of the Antihelix.

The *Concha*, ſo called from its reſemblance to a Fiſh-ſhell of that name. It is a large Cavity under the Antihelix,

helix, divided by the Helix into two parts, the inferior of which leads to the Meatus Auditorius.

The back-part of the External Ear exhibits only one confiderable *Eminence*, which is the convex Surface of the Concha.

The *Lobus*, which is the inferior foft part of the Ear, is compofed of Cellular Subftance, with a fmall quantity of Fat.

The Ear is covered by a continuation of the common Integuments, which is thinner here than on the reft of the Body, and is perforated in many parts by the mouths of Sebaceous Ducts, which are placed immediately under the Skin.

The motions of the Ear, which are very limited, are regulated by feveral *Mufcles*, fome of which are common to the Ear and Head, and others proper to the Ear itfelf. The common Mufcles have been already defcribed. The Mufcles proper to the Ear lie clofe upon the Cartilage, and, in the generality of fubjects, are fo thin, white, and indiftinct, as to receive from fome Authors the name of *Mufcular Membranes*.—They are as follow.

Helicis Major.

Origin: From the anterior acute part of the Helix, upon which it afcends.

Infertion; Into the Helix.

Action: To pull that part into which it is inferted a little downwards and forwards.

Helicis Minor.

Origin: From the under and fore-part of the Helix.

Infertion: Into the Helix, near the Fiffure in the Cartilage oppofite to the Concha.

Action: To contract the Fiffure.

Tragicus.

Origin: From the middle and outer part of the Concha, at the root of the Tragus, along which it runs.

Infertion: Into the point of the Tragus.

Action: To pull the point of the Tragus a little forwards.

Antitragicus.

Origin: From the internal part of the Antitragus, upon which it runs upwards.

Infertion:

Insertion: Into the tip of the Antitragus, as far as the inferior part of the Antihelix, where there is a Fissure in the Cartilage.

Action: To turn the tip of the Antitragus a little outwards, and depress the extremity of the Antihelix towards it.

Transversus Auris.

Origin: From the prominent part of the Concha, on the Dorsum, or back-part of the Ear.

Insertion: Into the outside of the Antihelix.

Action: To draw the parts to which it is connected towards each other, and to stretch the Scapha and Concha.

The *use* of the External Ear is to collect the sound, and convey it to the Meatus Externus,—the Muscles giving tension to it, so as to render the sounds more distinct.

The Cartilage of the External Ear is *connected* to the Temporal Bone by the common Integuments, and by its Muscles; and is furnished with Ligamentous Membranes, which fix it to the roots of the Zygoma and of the Mastoid Process.

The *Meatus Auditorius Externus* leads inwards, from the Concha, and in its course proceeds forwards and upwards, turning a little downwards at its farthest extremity, and terminating at the Membrana Tympani.—The turns, however, are so inconsiderable, that the bottom of the passage can be readily seen in a clear light, upon pulling the ear backwards.

It is somewhat of an *oval* form, a little contracted in the middle, and upwards of an inch in length.

Its outer end, which is a continuation of the Concha, is Cartilaginous, and has two or three *Interruptions* or *Fissures* in it.

On the upper and back-part of its circumference, there is a *Large Interruption* terminating in an oblique Margin, which is fixed to the rough edge, at the under part of the Osseous portion of the Meatus.

At the upper and back-part of the Meatus, the Cartilage has but little connection with the Bones, being there fixed by the Skin which lines the Canal.

The Osseous Canal is continued from the Cartilage of the

the Meatus, and is the longer of the two, particularly at the upper and back-part of the Paſſage.

The Meatus is lined with a continuation of the Skin, which fills up the interruptions in the Cartilage, but is thinner than on the reſt of the Body.

Under the Skin of the Meatus, and near its outer end, there are numerous ſmall Glands, of a yellowiſh colour, placed in a Reticular Subſtance, formed of the Corpus Mucoſum, and termed *Glandulæ Ceruminoſæ*, which diſcharge the Wax of the Ear through ſmall Excretory Ducts.

The *Arteries* of the External Ear come anteriorly from the Temporal, and poſteriorly from the Occipital, both of which are branches of the External Carotid Artery.

The *Veins* paſs partly to the External, and partly to the Internal Jugulars.

The fore-part of the Ear is ſupplied with *Nerves* from the third of the Fifth, and from the Portio Dura of the Seventh Pair; the under and back-part, by branches from the firſt and ſecond Cervicals.

The Meatus Externus conveys the ſound from the Outer towards the Inner Ear, and is ſuppoſed to do this to greater advantage, on account of the winding nature of the Paſſage.

The Wax lubricates the Paſſage, and defends it from the injuries of the air, and being of a viſcid and bitter quality, aſſiſts in the excluſion of inſects.

In the Fœtus, the Meatus is entirely Cartilaginous, and only adheres to an imperfect Bony Circle, in which the Membrana Tympani is fixed.

At the inner end of the Meatus Externus, the *Membrana Tympani* is ſituated, which has its name from covering the outer part of the *Tympanum* or *Drum* of the Ear.

It is firm, almoſt tranſparent, and of an oval form.

It is fixed in a *Groove* which divides the Meatus from the Tympanum.

It is very tenſe, but has a ſmall *depreſſion* in the middle next the Meatus, with a correſponding *convexity* towards the Tympanum, where the extremity of the Malleus is fixed to it.

Its ſituation is ſomewhat oblique, the upper part being turned outwards, and the under inwards, ſo that the lower ſide of the Meatus is a little longer than the upper.

It

It forms a complete *Septum*, and has no hole in it, ſuch as has been deſcribed by ſome Authors.

It is formed partly of a continuation of the Lining of the Meatus, but chiefly of the Perioſteum.

The Membrana Tympani has numerous ſmall *Veſſels* from the Temporal and Stylo-maſtoid Arteries, which run in a radiated manner, and which are moſt abundant in the Fœtus.

It is the Conductor of Sound from the Outer to the Inner Ear.

In the Fœtus, this Membrane is fixed in an imperfect Ring of Bone, and, along with the Meatus, is covered with a Mucous Membrane, which defends the parts from the too ſtrong impulſe of Sound.

THE INTERNAL EAR.

The *Internal Ear* comprehends the *Tympanum*, *Labyrinth*, and certain *Paſſages* leading into theſe.

The *Tympanum*, or *Drum* of the Ear, is ſituated at the inner ſide of the Membrana Tympani, approaches to a hemiſpherical figure, and is about half an inch in width.

Between the Tympanum and Cavity called Labyrinth, there is an *Oſſeous Septum*, which forms the bottom of the Tympanum, where there are *ſeveral Eminences*, viz.

The *Promontory*, which forms the beginning of the Scala Tympani, and divides the Tympanum into anterior and poſterior regions.

A *Protuberance* at the upper and back-part of the Tympanum, formed by the Aquæductus Fallopii.

A *Projection*, called *Eminentia Pyramidalis Tympani*, ſituated behind the Feneſtra Ovalis, in which is the Paſſage for the Stapedius Muſcle.

An *Eminence* at the upper and fore-part of the Tympanum, containing a ſemi canal, for lodging part of the Tenſor Tympani Muſcle.

In the Tympanum there are various *Paſſages*, whih communicate with the neighbouring parts, viz.

The *Iter a Palato ad Aurem*, or *Euſtachian Tube*, which goes off from the upper and fore-part of the Tympanum, and runs obliquely forwards and inwards to the poſterior opening of the Noſtril, and terminates at its outer edge, above the arch of the Palate.

The poſterior part of the Tube is formed in the Pars Petroſa,

Petrofa, at the upper and outer part of the Canal for the Carotid Artery.

The anterior portion is formed above, by the Spinous Procefs, and root of the Pterygoid Procefs of the Sphenoid Bone ;—and below, by Cartilage and Membrane.

It is narrow next the Ear, where it can only admit the point of a Surgeon's probe ; but becomes gradually wider towards the Nofe, where it terminates by an oblique opening with prominent fides, fufficiently large to admit a Goofe-quill.

It is lined by a Membrane fimilar to that of the Nofe, of which it appears to be a continuation ; and on the edge of the Mouth of the Tube, it is fo thick as to add confiderably to its prominency.

The Euftachian Tube preferves the balance of Air between the Outer and Inner Ear, and prevents it from preffing too forcibly upon the different Membranes placed in the fides of the Tympanum.

It has been fuppofed to convey the found of a perfon's own Voice to the Inner Ear ; but experiment does not favour this opinion, nor is it found to render Sound more diftinct when the Mouth is open ;—though perfons who are dull of hearing are obferved frequently to liften after this manner.

The *Cells of the Maftoid Procefs*, which open into the upper and back-part of the Tympanum, oppofite to, but a little higher than the Euftachian Tube.

They are very irregular, and have many windings and turnings, which communicate freely with each other, and are lined, like the Cells of other Bones, with the Periofteum Internum.

They affift the Tympanum in reflecting the Sound.

In Quadrupeds which hear acutely, there are large Cavities connected with the Tympanum, which feem to fupply the place of Maftoid Cells.

Above the Promontory, a *Hole*, called *Feneftra Ovalis*, the upper and under edges of which are convex upwards, —for lodging the Bafe of the Stapes.

The inner edges of this Hole are contracted by a narrow border, upon which the end of the Stapes refts.

Below the Feneftra Ovalis, and at the under and back-part of the Promontory, a *Hole*, fmaller than the former, called *Feneftra Rotunda*.

It is placed obliquely backwards and outwards, leads

to

to the Cochlea, but is ſhut up by a Membrane which aſſiſts in communicating Sound to the Labyrinth.

The *Sides*, or *Walls* of the Tympanum, which likewiſe aſſiſt in conveying Sound to the Labyrinth, are lined with Perioſteum, which is reflected into the different Paſſages leading from it.

The Cavity of the Tympanum contains four ſmall Bones, called *Oſſicula Auditus*, which form a chain ſtretching acroſs from the Membrana Tympani to the Labyrinth.

The *Oſſicula Auditus* are,—the *Malleus*, the *Incus*, the *Os Orbiculare*, and the *Stapes*;—theſe names being derived from ſubſtances which they are ſuppoſed to reſemble in ſhape.

The *Malleus*, or *Hammer*, conſiſts of a round Head, a ſmall Neck, a Manubrium or Handle, and two ſmall Proceſſes, one in the neck, long and very ſlender, and therefore called *Gracilis;* the other in the upper end of the Handle, called *Proceſſus brevis*.

The *Handle* is by ſome Authors conſidered as one of the Proceſſes, and is then called the longeſt of the three. It forms an angle with theNeck, becomes gradually ſmaller, and is bent, at its extremity, towards the Membrana Tympani.

In the natural ſituation, the *Head* is turned upwards and inwards, and the *Handle* down upon the Membrana Tympani, to which it adheres.

The *Incus*, compared in ſhape to an *Anvil*, but more reſembling one of the Dentes Molares, with its roots widely ſeparated, is ſituated behind the Malleus, and is formed of a *Body*, and *two Crura* of unequal lengths.

The *Body* has a *Cavity* and *two Eminences*, correſponding to that part of the Malleus with which it is articulated.

The *ſhort Crus* extends backwards, and is joined by a Ligament to the edge of the Maſtoid opening.

The *long Crus* is turned downwards, with the point a little flattened, and bent inwards.

The *Os Orbiculare* is the ſmalleſt Bone of the Body, being conſiderably leſs than a grain of Muſtard-ſeed.

It is articulated with the point of the long Proceſs of the Incus, and is ſo firmly fixed to it, that in ſeparating the ſmall Bones of the Ear from each other, it is apt to adhere to the Incus, and has on this account been frequently conſidered as a Proceſs of that Bone.

The

The *Stapes* is named from a ſtriking reſemblance it has to a *Stirrup*. It is divided into *Head*, *Crura*, and *Baſe*.

The *Head* is placed upon a ſmall flat neck, and is articulated with the Os Orbiculare.

The *Crura*, like thoſe of the Incus, are unequal in length, and have a groove within, which is occupied by a Membrane.

The *Baſe* is of an oval ſhape, and has no perforation in it. Its edges correſpond with thoſe of the Feneſtra Ovalis, with which it is articulated.

The Stapes is placed horizontally, being nearly at a right angle with the inferior Crus of the Incus.—Its two Crura are placed in the ſame plane,—the longeſt backwards.

The ſmall Bones of the Ear are *articulated* with each other by *Capſular Ligaments*, proportioned to their ſize, and are covered by the Perioſteum, which likewiſe fixes them to the Membrana Tympani and Feneſtra Ovalis.

The ſmall Bones have the following *Muſcles* fixed to them, which ſerve for their different motions.

TENSOR TYMPANI, Or *Internus Auris*.

Origin: From the Cartilaginous extremity of the Euſtachian Tube, near the entry of the Artery of the Dura Mater. From thence, its Fleſhy Belly runs backwards in a Canal peculiar to it, at the upper and inner part of the Oſſeous Portion of the Tube, being covered only by a thin plate of Bone. It ſends off a ſlender Tendon, which makes a turn in the Tympanum, and paſſes outwards.

Inſertion: Into the poſterior part of the Handle of the Malleus, a little below the root of its long Proceſs.

Action: To pull the Malleus and Membrana Tympani inwards, by which the Membrane is rendered more concave and tenſe, and better adapted for the impreſſion of weak ſounds.

LAXATOR TYMPANI.

Origin: By a very ſmall beginning, from the extremity of the Spinous Proceſs of the Sphenoid Bone, behind the entry of the Artery of the Dura Mater; after which it runs backwards and a little upwards, at the outſide of the Euſtachian Tube, in a Fiſſure of the Os Temporis, near the Foſſa which lodges the Condyle of the Lower Jaw.

Inſertion:

Inſertion: Into the long Proceſs of the Malleus, within the Tympanum.

Action: To draw the Malleus obliquely forwards and outwards, and thereby to render the Membrana Tympani leſs convex, or to relax it when Sounds are too ſtrong.—HALLER denies the exiſtence of Muſcular Fibres in this Subſtance.—SABATIER deſcribes it, but doubts of its Muſcularity.

STAPEDIUS.

Origin: By a ſmall Fleſhy Belly, from a little cavern in the Pars Petroſa, near the Cells of the Maſtoid Proceſs. Its Tendon paſſes forwards through a ſmall Hole in that Cavern, and goes into the Tympanum.

Inſertion: Into the poſterior part of the Head of the Stapes.

Action: To draw the Head of the Stapes obliquely upwards and backwards, by which the poſterior part of its Baſe is moved inwards, and the anterior part outwards, and the Membrana Tympani thereby put upon the ſtretch.

LABYRINTH.

The *Labyrinth*, ſo called from its Sinuoſities and windings, is ſituated at the inner part of the Tympanum, and is formed of the *Veſtible*, *Cochlea*, and *Semicircular Canals*, together with the *Canalis Fallopii* and *Meatus Auditorius Internus*.

The *Veſtible*, named from its forming a porch or entry to the Cochlea and Semicircular Canals, is of an oval figure, nearly of the ſize and ſhape of a clean grain of Barley, and is ſituated at the inner ſide of the Baſe of the Stapes.

There are three contiguous *Cavities* in the Veſtible, one of which, the *Semi-oval*, is ſituated above; another, the *Hemiſpherical*, below; and the third, or *Sulciform*, which is the orifice of the Aquæductus Veſtibuli, is placed behind.

In the Veſtible there are ſeveral Holes which communicate with the neighbouring parts, viz.

The *Feneſtra Ovalis*, ſituated at the outſide, by which it communicates with the Tympanum.

A *round Hole*, ſituated at the fore and under part, by which it communicates with one of the Canals of the Cochlea.

Five

Five Similar Foramina behind, by which it communicates with the Semicircular Canals.

Next the Meatus Auditorius ſnternus, it has four or five *Cribriform Perforations*, for the tranſmiſſion of Nerves.

The *Cochlea* is ſituated next the anterior extremity of the Os Petroſum, and at the fore-part of the Veſtible, in ſuch a manner as to have its Baſe towards the Meatus Auditorius Internus, and its Apex in the oppoſite direction,—or facing outwards.

It has two *Canals* or *Gyri*, called *Scalæ*, from a ſuppoſed reſemblance to Stair-caſes, the Gyri or Turns of which are very cloſe to each other, and run in a ſpiral direction, like the Shell of a Snail, from which the part has obtained its name.

The Cochlea forms *two Circumvolutions or Turns and a half*, the firſt of which is much larger and wider than the other Turn and a half, which become ſuddenly ſmaller.

The two Canals are upon the ſame level, the inner one next the Baſe, and the outer next the point of the Cochlea.

The *Gyri* go round a Nucleus, Axis, or central Pillar, which is nearly horizontal, and is formed of *two hollow Cones*, with their points turned to each other, the one termed *Modiolus*, from its reſemblance to the Spindle of a winding Stair-caſe, the other *Infundibulum*, or Funnel.

The *Modiolus* forms the inner and larger portion of the central Pillar, and is that Cavity ſeen in the under and fore-part of the Meatus Auditorius Internus.

It lodges that branch of the *Portio Mollis* of the Seventh Pair of Nerves, which goes to the Cochlea, and is Cribriform, or full of ſmall Holes for the paſſage of the twigs of that branch.

The Modiolus conſiſts of *two Plates*, with numerous *Cells* and *Paſſages* between them, and terminates in the middle of the ſecond Gyrus of the Cochlea.

The *Infundibulum* is an imperfect Funnel, the Apex of which is common with that of the Modiolus, and the Baſe is covered by the Apex of the Cochlea, which is termed *Cupola*.

Between the Scalæ of the Cochlea there is a Partition, called *Lamina Spiralis*, or *Septum Scalæ*, the larger portion of which, next the Modiolus, is formed of Bone: The remainder, or that part next the oppoſite ſide of the Scalæ, is Membranous, and termed by VALSALVA *Zona Cochleæ*.

Cochleæ.—This drops out by maceration, ſo as afterwards to leave only a partial Septum.

The Oſſeous part of the Lamina Spiralis is compoſed of *two extremely thin Cribriform Plates*, which gradually approach each other at their oppoſite edges, where they are perforated by numerous Holes.

The termination of the Lamina Spiralis, and of the Scala Tympani, forms a *Hamulus*, or ſmall Hook, which projects into the Infundibulum.

One of the Canals or Scalæ of the Cochlea, opens into the under and fore-part of the Veſtible, and is termed *Scala Veſtibuli:* The other, which is the ſmaller of the two, communicates with the Tympanum by the Feneſtra Rotunda, and is called *Scala Tympani.*

The Partition between the two Gyri or Turns of the Cochlea, like the Oſſeous part of the Lamina Spiralis, is formed of *two Plates*, with a ſmall *Cavity* between them.

The *Volute*, or Spiral of the Cochlea, begins below, runs forwards, and then round, ſo as to form, as has been already mentioned, two Circles or Turns and a half, the direction of the Gyri correſponding with thoſe of the Shell of a Snail.

The Canals of the Cochlea are conical, becoming gradually ſmaller towards the Apex, where they communicate freely with each other, through the medium of the Infundibulum.—This communication is called by CASSEBOHM, who gives the fulleſt Treatiſe upon the Ear, *Canalis Scalarum Communis.*

The *Semicircular Canals* are three in number,—the *Superior* or *Vertical*,—the *Poſterior* or *Oblique*,—and the *Exterior* or *Horizontal.*

The *Superior* is placed tranſverſely, in the upper part of the Pars Petroſa, with its convex ſide upwards.

The *Poſterior* is farther back than the former one, and is parallel to the length of the Pars Petroſa, with the convex ſide turned backwards.—One of its extremities is placed above, and the other below, the upper extremity joining with the internal one of the Vertical Canal, by which a common Canal is formed.

The *Exterior* is leſs than the other two, which are more of an equal ſize, is placed next the Tympanum, and has its extremities and curvatures nearly upon the ſame plane;—with the curve placed backwards.

Each of the Canals forms upwards of three-fourths of a circle, can admit the head of a ſmall Pin, and has an Enlargement,

Enlargement, Ampulla, or Cavitas Elliptica, at one end, the other extremity being nearly of the ſame ſize with the reſt of the Canal.

The *Orifices* are only five in number, two of the Canals having a common termination. Of theſe Orifices, three are ſituated at the inſide, and two at the outſide of the Veſtible, into the poſterior part of which they open.

In the bottom of the Meatus Auditorius Internus, which is ſituated in the poſterior Surface of the Pars Petroſa, there is a large under, and a ſmall upper *Foſſula*, ſeparated by a ſharp Ridge.

The fore-part of the inferior Foſſula leads towards the Cochlea, and is perforated with numberleſs *ſmall Holes*, through which branches of the Portio Mollis of the Seventh Pair of Nerves paſs to the Cochlea.

One Hole in the centre, larger than the reſt, tranſmits a branch of that Nerve to the Infundibulum.—This Hole, however, is frequently enlarged, in conſequence of the Bone, which is extremely thin, being broken while preparing it.

In the back-part of the inferior Foſſula, three or four *Cribriform Holes* appear, for the tranſmiſſion of branches of that part of the Portio Mollis deſtined for the Veſtible and Semicircular Canals.

In the upper Foſſula of the Meatus Internus, there are *two Paſſages*, one poſterior and ſmaller, tranſmitting Nerves into the Elliptical Cavity of the Veſtible.

The other, the anterior and largeſt, is termed *Canalis*, or *Aquæductus Fallopii*,—from a reſemblance it bears to an Italian Aqueduct, and ſerves for the tranſmiſſion of the Portio Dura of the Seventh Pair of Nerves.

The *Canal* of *Fallopius* goes through the upper part of the Pars Petroſa, paſſes downwards and backwards between the Foramen Ovale and external Semicircular Canal, and terminates in the Foramen Stylo-Maſtoideum.

In its paſſage through the Pars Petroſa, it communicates with the Foramen Innominatum, ſituated on the upper and fore-part of the Proceſs.

In Children, the Labyrinth is almoſt as large as in Adults, its Subſtance complete and hard, while the Bone which ſurrounds it is ſoft and ſpongy; on which account it is eaſily ſeparated from the reſt of the Pars Petroſa.

The different Cavities and Paſſages of the Labyrinth are lined with the Perioſteum, which in the Veſtible

fills the Feneſtra Ovalis, and of conſequence covers the Baſe of the Stapes.

The Perioſtea of the two Canals of the Cochlea form, by their union, the Membranous portion of the Lamina Spiralis, which, together with the Oſſeous part, completes the Septum between the two Scalæ.

The Perioſteum of the Cochlea alſo aſſiſts that of the Tympanum, in forming the Membrane of the Feneſtra Rotunda, and which is ſometimes called *Membrana Tympani Secundarii*, from a reſemblance to the Membrana Tympani, and from being, like it, a little concave on the outer, and convex on the inner Surface, or where it faces the Scala to which it belongs.

Beſides the Perioſteum, the Veſtible, Cochlea, and Semicircular Canals contain a *Pulpy Membrane*, upon which the Portio Mollis is irregularly diſperſed.

In the Veſtible, the Pulpy Membrane forms a *Sac*, in ſhape reſembling that of the Oſſeous Cavity which contains it, and which is deſcribed and beautifully delineated by SCARPA.

When the Sac is laid open upon the upper and outer part, a *Partition* appears, of the nature of the Sac, termed by Dr MECKEL, *Septum Veſtibuli Nervoſo-membranaceum*.

In the Cochlea, the Pulpy Membrane is in contact with the Perioſteum, but can be ſeparated from that Membrane without much difficulty.

In the Semicircular Canals, it is at ſome diſtance from the Perioſteum of theſe Bones, and is conſiderably ſmaller, but, like them, it forms diſtinct Tubes, which communicate with the Veſtible. Like the Oſſeous Canals alſo, the Membranous Canals form Ampullæ, or Elliptic Cavities at one end.

The *Arteries* of the Labyrinth ariſe by one or two ſmall branches, chiefly from the Vertebral Artery, and paſs through the Cribriform Plate, at the bottom of the Meatus Externus which belongs to the Labyrinth.

From the Labyrinth one or two *Veins* return, and terminate in the end of the Lateral Sinus.

The Cavity of the Veſtible contains no Air, but is conſtantly filled with a *Watery Fluid*, ſuppoſed to be ſecreted from the Arteries of the Perioſteum, and which is found to reſemble the Aqueous Humour of the Eye.

The Aqueous Fluid fills the Veſtible and Scalæ of the Cochlea, and likewiſe ſurrounds the Membranous Semicircular Canals.

The

The *Aqua Labyrinthi* is confidered as a medium by which founds are communicated from the Membrane filling the round and oval Holes, and from the Bafe of the Stapes to the Pulpy Membrane placed in it.

The fuperfluous part of the Aqua Labyrinthi is fuppofed by COTUNNIUS to be carried off by two fmall *Conical Ducts*, more particularly defcribed by him than by fome preceding Anatomifts, who were partly acquainted with them, but confidered them as Blood-veffels.

One of the Aqueducts of COTUNNIUS, called *Aquæductus Cochleæ*, begins at the under part of the Scala Tympani, near the Feneftra Rotunda, and, after paffing through the Pars Petrofa, is feen, in the figures he gives of it, terminating by a wide triangular opening, upon the furface of the Dura Mater, between the paffages of the Seventh and Eighth Pair of Nerves.

The other Duct, called *Aquæductus Veftibuli*, begins under the termination of the common Canal, in the Veftible, from which it defcends, and terminates by a triangular opening between the Layers of the Dura Mater, behind the Meatus Internus, and half way between the upper edge of the Pars Petrofa and Diverticulum of the Internal Jugular Vein.

For a full account of thefe Ducts, and of the other parts of the Labyrinth, fee *a Defcription of them by* Dr MECKEL *of Berlin.*

The *Nerves* of the Labyrinth are derived entirely from the Seventh Pair.

The *Auditory Nerve* is compofed of two branches, one of which is called *Portio Dura*, and is harder than the other, termed *Portio Mollis.*

The Trunk of the Auditory Nerve paffes into the Meatus Externus, covered by the invefting Membrane of the Brain.

The *Portio Dura* goes through the Canalis Fallopii, fending off, in its paffage, branches through Perforations in its fides, to the Stapedius Mufcle and Maftoid Cells.

One *reflected branch* paffing through the Foramen Innominatum, in the Pars Petrofa, forms a connection between the Portio Dura and the fecond part of the Fifth Pair.

Another, called *Chorda Tympani*, paffes acrofs the Cavity of the Tympanum, between the inferior Crus of the Incus and handle of the Malleus, and at the outfide of the Euftachian Tube, to join the Lingual branch of the

Fifth Pair. In its paſſage, it ſupplies the Muſcles of the Malleus, and Membranes, &c. of the Tympanum.

The remainder of the Portio Dura is diſperſed upon the Face.

The *Portio Mollis* is divided into two principal parts,—one to the Cochlea, the other to the Veſtible.

The branches of the Cochlea paſs through the Cribriform Plates of the Modiolus, to the Pulpy Membrane lying in the Scalæ.

The branches run between, and likewiſe on the outſide of the Partitions which divide the Cochleæ into Gyri, and the Gyri into Scalæ, and are large and numerous in proportion to the part they ſupply.

The largeſt and moſt numerous of theſe branches are diſperſed upon the Lamina Spiralis, where they form an intricate Plexus, the Threads of which are at firſt opaque, but are afterwards of the colour of the Retina of the Eye.

The branches terminate, and appear alſo to meet upon that part of the Pulpy Membrane, which is moſt diſtant from the Modiolus.

Through the Cribriform Plate, common to the Modiolus and Infundibulum, the laſt branches of this portion of the Nerves paſs, to be ſpread out upon the Membrane lying within the Infundibulum.—*For a particular deſcription of that part of the Portio Mollis diſtributed to the Cochlea, and of the Cochlea itſelf, See* Dr MONRO's *Treatiſe on the Ear.*

Of that part of the Portio Mollis deſtined for the Veſtible and Semicircular Canals, one branch goes through the poſterior Hole in the upper part of the Meatus Internus; the reſt paſs through the holes in the under and back-part of the Meatus, already pointed out in the deſcription of that Paſſage.

After perforating the Foramina, the Nerves are ſeen firſt in diſtinct Plexus, but become afterwards tranſparent, and are loſt upon the Sac contained in the Veſtible, and upon the Ampulla of the Membranous Semicircular Canals.

The *Portio Mollis* is the primary part of the Organ of Hearing, to which all the other parts are ſubſervient, and may be regarded as being of the ſame ſervice to the Ear, as the *Retina* is to the Eye.

OF THE MOUTH, Tongue, *AND THROAT*,

WITH THEIR APPENDAGES.

MOUTH.

The *Offeous Parts* of the mouth are,—the *Offa Maxillaria Superiora*, the *Offa Palati*, the *Maxilla Inferior*, and the *Teeth* ;—all of which have been already defcribed.

The *Soft Parts* of the Mouth confift of the *Lips* and *Cheeks*, the *Gums*, the *Palate*, the *Velum Palati*, the *Uvula*, the *Tongue*, the *Membrane* lining the Mouth, and the *Salivary Glands*.

The *Lips* and *Cheeks* are principally compofed of Mufcles, are covered on the outfide by the common Integuments, and lined within by the Membrane of the Mouth, under which there are numerous Mucous Glands, which obtain their names from their fituations.

The intervening fpace between the Maffeter and Buccinator Mufcles is occupied by a large quantity of Fat, which gives form to the Face.

The *Membrane* of the Mouth is covered with fine *Villi;* but thefe are moft confpicuous upon the edges of the Lips, as may be readily feen after a fine injection, or after macerating the parts till the Cuticle can be feparated.

From the edges of the Lips, the Common Integuments (now become extremely thin) are converted into the Membrane which is continued into the Cavity of the Mouth, and which, oppofite to the Dentes Incifores of the Upper and Under Jaws, forms a fmall Doubling or *Frænum*, which fixes the Lips more firmly to the Jaws.

The Lips are ferviceable in the general purpofes of Speaking, Eating, Drinking, &c.

The *Gums* cover the fides of the Alveolar Border of both Jaws, pafs in between the different Teeth, and furround and adhere firmly to the Collar of each.

The

The Subſtance of the Gums is of a denſe nature, very Vaſcular, and the Veſſels united by a compact Cellular Subſtance.

They may be ſaid to conſiſt of the Common Membrane of the Mouth and the Perioſteum of the Jaws intimately connected.

They ſerve as a covering to the Jaws, and aſſiſt in the ſecurity of the Teeth.

The *Arteries* of the Lips, Cheeks, and Gums, are from the Facial, Temporal, and Internal Maxillaries, which are derived from the External Carotids.

The *Veins* go chiefly to the External, and partly to the Internal Jugulars.

The *Nerves* come from the firſt and ſecond branches of the Fifth Pair, and alſo from the Portio Dura of the Seventh Pair.

The *Palate* is divided into the *Palatum Dure* and *Palatum Molle*. The former is compoſed of the Palate-plates of the Upper Jaw, and is covered by the Perioſteum and common Membrane of the Mouth, which prevent the Bones from being injured.

The Membrane which covers the Bones of the Palate forms numerous *Rugæ*, which aſſiſt in the diviſion of the Food.

It is nearly of the ſame ſtructure with that of the Gums, but perforated by the Ducts of the Palatine Glands, for the excretion of Mucus, which ſerves to lubricate the Palate, and aſſiſts in diſſolving the Food.

The *Palatum Molle*, *Velum Pendulum Palati*, or *Soft Palate*, is that part which depends from the poſterior edge of the Oſſa Palati, and from the Pterygoid Proceſſes of the Sphenoid Bone, and forms a Partition between the Noſe and Mouth.

It is compoſed of the Membranes which line the Noſe and Mouth, and of the expanſions of the Circumflex and Levator Palati Muſcles, and numerous Mucous Glands which ſerve to lubricate the Mouth and Throat, and facilitate deglutition.

The Palatum Molle conducts the Fluids of the Noſe into the Mouth, and acts like a Valve in preventing what we ſwallow from paſſing into the Noſe.

In the middle of the poſterior edge of the Velum Palati, the *Uvula*, or *Pap* of the Throat, takes its origin, and hangs pendulous, from the Velum over the root of the Tongue.

It is of a Conical form, is covered by the Membrane of the Mouth, and has a ſmall Muſcle within it, by which it is elevated and ſhortened,—its other motions depending upon the Muſcles of the Palate.

The *uſe* of the Uvula in Speaking and in Deglutition, is evident from the inconveniencies which reſult from its being deſtroyed by diſeaſe.

The *Arteries* of the Palate, &c. come from the Facial, and Internal Maxillary.

The *Veins* go to the External and Internal Jugulars.

The *Nerves* are chiefly from the ſecond of the Fifth, with ſome twigs from the Eighth Pair.

Tongue.

The *Tongue* is of an *Oval form*, and is divided into *Baſe*, *Body*, and *Apex*.

The *Baſe*, or poſterior part of the Tongue, is connected to the Os Hyoides, and, by the medium of this, to the adjacent Bones and Muſcles.

The *Body*, or middle part of the Tongue, terminates anteriorly in the looſe moveable point.

On the Dorſum or upper Surface, there is a *Linea Mediana*, or middle Groove, running longitudinally, and dividing it into two lateral convexities.

The inferior Surface, which reaches only from the middle of the Tongue to the point, is connected to the parts below it by the Sublingual Ligament, or *Frænum Linguæ*, which is a doubling of the Skin, or lining of the Mouth.

The ſides of the Tongue are fixed to the Lower Jaw and Styloid Proceſſes, and parts adjacent, by *Membranous Ligaments*.

The Tongue is chiefly *compoſed* of the Fibres of the Muſcles which ſerve for its motions.—Theſe Fibres are diſpoſed in various directions, and intermixed with a Medullary Fat.

The upper and lateral parts of the Tongue are compoſed of the Stylo-Gloſſi.—Its middle portion, between the two former Muſcles, is formed of the Linguales.—The lower part is chiefly formed of the Genio-Gloſſi ;—and behind, the Stylo-Gloſſi enter into its compoſition.

The Tongue is covered by a continuation of the common Integuments, which are preſerved ſoft and moiſt by the Saliva.

The

The Cuticle forms Vaginæ, for receiving the Subſtances called *Papillæ*.

The Corpus Mucoſum of the Tongue is thicker than in other parts of the Body, but more moiſt.

The third covering of the Tongue, the Cutis Vera, is remarkably Nervous.—The Papillæ, which take their origin from it, are very Vaſcular, eſpecially near the Apex of the Tongue, but are awanting on its under Surface.

The *Papillæ* are divided into three kinds, the *Maximæ*, *Mediæ*, and *Minimæ*.

The firſt claſs, called *Papillæ Maximæ, Lenticulares*, or *Capitatæ*, are by much the largeſt, and of a Lenticular form, having round Heads and ſhort Stems.

They are placed at the Baſe of the Tongue, in ſuperficial Foſſulæ, and are diſperſed in ſuch a manner as to form an angle with its point backwards.

They are Glands of the Salivary kind, and have each of them a ſmall Perforation in the middle of its convex Surface, for the excretion of Mucus.

Beſides the Papillæ Capitatæ, there are numerous *Mucous Follicles*, which cover the greater part of the Surface of the root of the Tongue.

At the root of the Tongue, and behind the angle formed by the Papillæ Maximæ, there is a Hole, called *Foramen Cæcum* of MORGAGNI, by whom it was firſt deſcribed.

It penetrates only a ſmall way into the Subſtance of the Tongue, and receives the Mouths of ſeveral Excretory Ducts which terminate in it.

The ſecond claſs, called *Papillæ Mediæ*, or *Semi-lenticulares*, are much ſmaller than the former, and are ſcattered over the upper Surface of the Tongue, at ſome diſtance from each other.

They are of a Cylindrical form, and terminated by a round extremity.

The third claſs, termed *Papillæ Minimæ*, or *Conicæ*, or *Villoſæ*, are by much the moſt numerous, but very minute. They occupy almoſt the whole upper Surface of the Tongue, but are moſt abundant towards the Apex, where the ſenſation of Taſte is moſt acute.

This and the ſecond claſs have been ſuppoſed to be formed chiefly of the extremities of Nerves, and to conſtitute the real Organ of Taſte; though other parts, as

the

the Palate, and even the, Pharynx and Esophagus, poſ-ſeſs the faculty of Taſte in a certain degree.

The principal Blood-veſſels of the Tongue are large, in proportion to the ſize of that Organ.

They are called *Linguales*, or *Raninæ*, on account of the dark-coloured branches which appear under the Tongue.

The *Arteries*, which are branches of the External Carotids, are not found to communicate ſo freely on the oppoſite ſides of the Tongue, as they do in other parts of the Body.

The *Veins* open chiefly into the External Jugulars.

The *Nerves*, like the Arteries, are large and numerous, and have little connection on the oppoſite ſides.

They come from the Fifth, Eighth, and Ninth Pairs.

The firſt ſet ſupply the parts next the point of the Tongue, and are therefore conſidered as being principally concerned in conveying the ſenſation of Taſte.

The ſecond ſet ſupply the root, and the third the middle of the Tongue, and are chiefly diſperſed upon its Muſcles.—There is a conſiderable intermixture, however, between the three ſets on the ſame ſide.

Beſides being the principal Organ of Taſte, the Tongue is the chief inſtrument of Speech, and of the articulation of the Voice.—It alſo aſſiſts in Manducation, Deglutition, Spitting, Sucking, &c.

The *Salivary Glands* conſiſt of three large Glands on each ſide of the Face, viz.—the *Parotid*, the *Submaxillary*, and the *Sublingual*;—beſides many ſmall Glands, named from the parts to which they belong.

They are of a yellowiſh colour, and irregular on their Surface, being of the Conglomerate kind.

The *Parotid Gland*, which is the largeſt of the Salivary Glands, is named from its ſituation near the Ear.

It occupies the whole ſpace between the Ear, Maſtoid Proceſs, and angle of the Lower Jaw.

It extends ſuperiorly to the Zygoma, and anteriorly to the Maſſeter Muſcle, part of which it covers.

The under end of it lies contiguous to the Submaxillary Gland.

From the different parts of the Gland, numerous ſmall Branches ariſe, which join together to form a large Duct, ſometimes called STENO's *Salivary Duct*, or *Ductus Superior*, which paſſes from the upper and fore-part of the Gland.

The

The Parotid Duct is of a white colour and large ſize, but, from the thickneſs of its Coats, the Cavity is ſmall, in proportion to the outſide of the Duct.

It paſſes anteriorly, in a tranſverſe direction, over the Tendon of the Maſſeter Muſcle, by which it is free from compreſſion, and deſcends a little to perforate the Buccinator Muſcle, oppoſite to the ſecond or third Dens Molaris of the Upper Jaw.

In croſſing the Maſſeter Muſcle, it receives ſometimes one, ſometimes two minute Ducts, from an equal number of ſmall Glands, called by HALLER, *Glandulæ Acceſſoriæ.*

The *Inferior Maxillary*, or *Submaxillary Gland*, is ſmaller and rounder than the Parotid, and is ſituated on the inſide of the angle of the Lower Jaw, between it and the Tendon of the Digaſtric Muſcle.

From the upper and fore-part of this Gland, a Duct ariſes, called by ſome Authors *Ductus* WHARTONII, or *Ductus Inferior*, which is much thinner in ſubſtance than the former Duct, but longer.

It paſſes forwards between the Mylo-Hyoideus and Genio-Gloſſus Muſcles, along the under and inner edge of the Sublingual Gland, to the ſide of the Frænum Linguæ, and terminates behind the Dentes Inciſores, by a ſmall orifice, in form of a Papilla.

The *Sublingual Gland* is ſmaller and ſofter than the Submaxillary, and is flat, and of an oval form.

It is ſituated under the anterior portion of the Tongue, above the Duct of the inferior Maxillary Gland, near the Lower Jaw, between the Mylo-Hyoides and Genio-hyogloſſus Muſcles, the former of which ſuſtains it.

Its extremities are turned forwards and backwards, and the edges obliquely inwards and outwards.

It is covered by a continuation of the Skin of the under ſide of the Tongue, which fixes the Gland in its place.

It opens by ſeveral orifices arranged in a line near the Gums, a little to the outſide of the Frænum.

In many Quadrupeds, there is a diſtinct Duct belonging to this Gland, like that of the Submaxillary.

Sometimes this Gland ſends off a Branch which communicates with that of the Submaxillary, but generally it is otherwiſe.

The ſmaller Glands of the Mouth are in great numbers,

bers, lying between the inner lining of the Mouth and its Muſcles, and deriving their names from their ſituations.

They are ſmall ſimple Glands, each ſending a Duct, which perforates the Skin of the Mouth, and opens into its Cavity.—They conſiſt of—

The *Buccales*, which are placed all over the Cheek, but moſt plentifully near the termination of the Parotid Duct;

The *Labiales*, lying on the inſide of the Lips;

The *Palatinæ*, upon the Palate; and

The *Linguales*, at the root of the Tongue.

The *Arteries* of the Salivary Glands are from different Branches of the External Carotids.

The Parotid is ſupplied from the Temporal, the Inferior Maxillary from the Facial, and the Sublingual from the Lingual Artery.

The *Veins* of theſe Glands go to the External Jugulars.

Their *Nerves* are chiefly from the third part of the Fifth, and from the Portio Dura of the Seventh Pair.

The Salivary Glands ſerve for the ſecretion of the Saliva, which they pour out in large quantity, and which is promoted by the motion of the Lower Jaw.—The Saliva aſſiſts in the ſolution of the food in the Mouth, in lubricating the Throat for its paſſage downwards, and in the digeſtion of it in the Stomach.

THROAT.

The *Throat* conſiſts of the *Arches of the Palate*, of the *Pharynx and Larynx*, with the *Muſcles*, *Veſſels*, *Nerves*, &c. which ſurround them.

The *Arches of the Palate* are two in number, in each ſide of the Throat, one of which is termed the *Anterior*, the other the *Poſterior*.

They are formed of a Doubling of the Skin, with a few ſcattered Muſcular Fibres.

The *Anterior* ariſes from the middle of the Velum Palati, at the ſide of the Uvula, and is fixed to the edge of the Baſe of the Tongue.

The *Poſterior* has its origin likewiſe from the ſide of the Uvula, and paſſes downwards, to be inſerted into the ſide of the Pharynx.

 The

The Anterior Arch contains the Circumflex Mufcle of the Palate, and, with its fellow on the oppofite fide, forms the opening into the Throat, called *Iſthmus Faucium.*

The Pofterior Arch has within it the Levator Mufcle of the Palate.

Between the Anterior and Pofterior Arches, and clofe by the fides of the Bafe of the Tongue, the *Amygdalæ, Tonſils,* or *Almonds* of the Ears, are fituated.

They are of a reddifh colour, of the figure of Almonds, full of Cells which communicate with each other, and have large irregular openings, which convey the Mucus into the Throat, the difcharge of which is promoted by the motion of the furrounding parts.

Pharynx.

The *Pharynx*, fo called from its conveying Food to the Stomach, and Air to the Lungs, is a large Mufcular Bag, in form of an irregular Funnel, with the Tube called *Eſophagus* defcending from it, and forming the under end of that Funnel.

It is bounded above by the Cuneiform Procefs of the Occipital Bone, the Pterygoid Proceffes of the Sphenoid Bone, and back-part of the Jaws, with all of which it is intimately connected.

The anterior margins of its Flefhy parts are connected to the edges of the Larynx, and its fides are covered by the great Blood-veffels of the Neck.

The fore-part of the Pharynx is formed by a Membrane common to it and to the back-part of the Larynx.

Behind, it lies flat upon the Cervical Vertebræ, and upon the Mufcles which cover the fore-parts of the fides of thefe Vertebræ.

It has feveral *Openings* by which it communicates with neighbouring Cavities.

Two of thefe lead upwards and forwards by the pofterior Nares into the Nofe ;—two go laterally by the Euftachian Tubes to the Ears ;—one paffes forwards through the large opening, termed Fauces, or Top of the Throat, to the Mouth ;—one goes downwards and forwards, through the Larynx and Trachea, to the Lungs ;—and another directly downwards by the Efophagus to the Stomach.

The Pharynx is furrounded by a loofe Cellular Subftance, and confifts of different Layers of Mufcles, called

Conſtrictores

Conſtrictores Pharyngis, which have been already deſcribed.

On the inner ſide, it is lined by the continuation of the Membrane of the Mouth, which is perforated by the Ducts of numerous Glands, for the ſecretion of Mucus.

The lower end of the Pharynx, oppoſite to the under edge of the Cricoid Cartilage, deſcribes a complete Circle, which forms the beginning of the Eſophagus.

The Pharynx is ſupplied with Blood by the Pharyngeal Branches, which come directly or indirectly from the External Carotids.—It returns its Blood to both Jugular Veins.—Its nerves are from the Eighth Pair.

The *Uſe* of the Pharynx is,—to receive the Aliments from the Mouth, and by the action of its Muſcles to convey them to the Eſophagus. It muſt likewiſe aſſiſt in the modification of the Voice.

Larynx.

The *Larynx*, ſo called from its being the principal Organ of Voice, is ſituated at the upper and fore-part of the Neck, immediately under the Os Hyoides, which is placed at the root of the Tongue.

It is compoſed of Cartilages and Muſcles, Ligaments, Membranes, and Mucous Glands; and is connected above, to the Tongue and Os Hyoides, and behind, to the Pharynx.

The *Cartilages* of the Larynx are generally conſidered as being five in number, though, beſides theſe, ſome chooſe to enumerate ſmall Projections which are connected with them.

The *Five* Cartilages are,—the *Thyroid*, the *Cricoid*, the *Two Arytenoid*, and the *Epiglottis*.

The *Thyroid*, *Scutiform*, or *Shield-like Cartilage*, is placed at the upper and fore-part of the Larynx, and is the largeſt of the whole.

When ſpread out, it is of an oblong ſhape, but, in the natural ſituation, it conſiſts of two lateral Wings or Portions, of a quadrangular form, uniting before in a longitudinal angle, which can be readily felt in the fore-part of the Throat, and which, from its projecting more in Men than in Women, has obtained the name of *Pomum Adami*.

The upper part of the angle is formed into a Notch, from which, and from the upper edge of the Cartilage in general,

general, a *broad Ligament* afcends, to fix it to the under part of the Os Hyoides.

From the pofterior corners four Proceffes project, called *Cornua*, two of which, termed *Superior*, are long, and afcend to be joined by round Ligaments to the extremities of the Cornua of the Os Hyoides.

In the middle of thefe Ligaments, one or two fmall Cartilaginous, or even Offeous Subftances, are frequently found.

The other two Cornua, called *Inferior*, are fhorter than the Superior, and curved backwards, to be fixed to the fides of the Cricoid Cartilage.

The Thyroid Cartilage ferves for the protection of the other Cartilages, and, along with the Os Hyoides, preferves the Paffage open, for the tranfmiffion of the Food to the Stomach.

The *Cricoid*, or *Annular*, or *Ring-like Cartilage*, is placed below, and likewife behind, the Thyroid, and, like it, may be readily felt in the fore-part of the Throat.

It is narrow before, where it lies under the Thyroid Cartilage, and thick, broad, and ftrong pofteriorly, where it is placed behind that Cartilage.

Its Pofterior Surface is divided by a *Ridge* into *two lateral Cavities*, for the reception of the pofterior Crico-arytenoid Mufcles.

Its under edge is horizontal, and fixed to the beginning, or firft Cartilage of the Trachea.

The upper edge flants confiderably, and has its anterior narrow part fixed to the under edge of the Thyroid Cartilage.

It has four fmall Articular Surfaces, with diftinct Capfular Ligaments, of which two are placed above, for the articulation of the Arytenoid Cartilages, and two at the under and lateral parts, for the connection of the inferior Cornua of the Thyroid Cartilage.

The Cricoid Cartilage forms part of the general Tube of the Trachea, conftitutes the Bafe of the Larynx, and gives a firm fupport to the Arytenoid Cartilages.

The *two Arytenoid Cartilages*, named from a fuppofed refemblance to an Ewer, or Drinking-cup of the Ancients, are much fmaller than the other Cartilages, and are placed upon the upper, pofterior, and lateral parts of the Cricoid Cartilage, at a fmall diftance from each other.

They are of a *triangular* form, and a little twifted, and are

are bent back, ſo as to have a broad concave Surface behind.

Their upper extremities are turned towards each other, and are conſidered by ſome Authors as diſtinct Cartilages.

Their Baſes are *broad* and *hollow*, where they are articulated by Capſular Ligaments with the Cricoid Cartilage, upon which they are moved in different directions, by the action of various Muſcles.

They are connected to each other, and to the adjacent Cartilages, by different Muſcles and Ligaments.

The Arytenoid Cartilages form a part of the opening called *Glottis*, and give attachment to its Ligaments.

The *Epiglottis*, obtaining its name from its ſituation above the Glottis, is of an oval form when ſurrounded by its Ligaments and Membranes, but, when diveſted of theſe, it is found to be narrow below, broad above, and rounded at its upper extremity.

It is convex towards the Tongue, and concave towards the Glottis, with its point reflected a little forwards.

It is placed behind the upper part of the Thyroid Cartilage, is ſituated obliquely over the Glottis, and may be ſeen and examined by preſſing down the root of the Tongue.

Its under end is fixed by a broad and ſhort Ligament to the middle Notch of the Thyroid Cartilage, and by two lateral Ligaments to the whole length of the Arytenoid Cartilages.

It is fixed to the roots of the Os Hyoides and Tongue by another Ligament, which is a doubling of the inner Membrane running along the middle of its anterior Surface, and forming the *Frænum Epiglottidis*.

It is very elaſtic, and is much more pliable than the other Cartilages, being of a Cartilago-ligamentous nature.

It is found to have a number of *Fiſſures*, in which *Lacunæ* are placed, and to be perforated by numerous *Foramina*, which are the Mouths of ſo many Mucous Follicles, and which are in a great meaſure concealed by the Membrane which covers it.

It breaks the current of the Air coming from the Mouth and Noſe, and prevents it from ruſhing too forcibly into the Cavity of the Lungs.—Preſſed and drawn down by the Tongue and by ſmall Muſcles, it defends the

the Glottis, and ſhuts it completely in the time of ſwallowing.—After the action of ſwallowing, it is raiſed by its own elaſticity, and by the root of the Tongue to which it is fixed, returning to its former poſition.

Ligaments of the Glottis.—From the fore-part of the body of each of the Arytenoid Cartilages, a *Ligamentous Cord* paſſes horizontally forwards, to be fixed by its other extremity to the inſide of the anterior angle of the Thyroid Cartilage.

The *opening* formed between theſe Ligaments is called *Glottis*, from Γλωττα, the Tongue: It is alſo called *Mouth of the Larynx*, and *Rima Glottidis*, and is of a triangular figure, the Ligaments being at a greater diſtance behind than at their anterior extremity.

Under theſe two Ligaments there are two others, larger and more diſtinct than the former, and which are commonly conſidered as the *proper Ligaments of the Glottis*. They ariſe from the Baſe of the Arytenoid Cartilages, and run in the ſame direction with the former, to be fixed alſo to the Thyroid Cartilage.

In the Interſtice of the Superior and Inferior Ligaments, on each ſide there is a *Fiſſure*, which leads to a ſmall Membranous Cavity or Depreſſion, with its bottom turned outwards.

Theſe are the *Ventricles of the Larynx* of GALEN.—They are chiefly formed by the inner Membrane of the Larynx.

They differ in ſize in different people, have Mucous Follicles opening into them, and are found to be ſerviceable in the modulation of the Voice.

On the anterior Surface of the Arytenoid Cartilages, there is a ſmall Depreſſion, filled by a *Glandular Body*, which not only covers the fore-part of theſe Cartilages, but is continued over the poſterior extremity of the Ligaments of the Glottis.

The *Arytenoid Glands* are larger in ſome ſubjects than in others. They were diſcovered, and are particularly deſcribed and delineated, by MORGAGNI.

The Ligaments which connect the Epiglottis to the Notch of the Thyroid Cartilage, and to the under ſide of the Os Hyoides, and one which ties the Baſe of the Os Hyoides, form a *triangular ſpace*, which is alſo occupied by Cellular Subſtance and by Mucous Glands.

The Cavity of the Larynx is lined by a Membrane which is extremely irritable, and is every where perforated

rated by the Mouths of ſmall Mucous Glands, for the purpoſe of moiſtening it.

The Larynx has a number of Muſcles, for its different motions; all of which have been already deſcribed.

The *Arteries* of the Larynx are the two ſuperior Laryngeals, which come from the External Carotids, and the two inferior Laryngeals, which are ſent off from the Subclavian Arteries.

The *Veins* return to the External Jugulars.

The *Nerves* are chiefly the ſuperior and inferior Laryngeals, which are branches of the Eighth Pair.

The Larynx ſerves the purpoſe of Reſpiration, forms and modulates the Voice, and is alſo uſeful in Deglutition.

It is the principal Organ of Voice;—for, if a hole be made in the Trachea, and the paſſage of the Larynx ſtopped, the Air eſcapes by that opening without producing Voice.

Voice is formed by the Air, in its paſſage through the Glottis, acting upon the Ligaments of the Glottis and Cartilages of the Larynx and Trachea, and thus producing a Tremour;—and is different in different perſons, according to the Form and Structure of the Larynx.

The ſtrength of Voice is in proportion to the quantity of Air expired, and the narrowneſs of the Glottis.

A Tone is acute in proportion to the tenſion of the parts of the Larynx and Trachea in general, and of the Ligaments of the Glottis in particular.

A Tone is grave in proportion to the reverſe of the above.

Speech is performed chiefly by the different parts of the Mouth, aſſiſted by the Cavity of the Noſe,—the Larynx moving only in a ſmall degree.

When the Air paſſes through the Larynx without producing a Tremour, it occaſions a Whiſper.

When a perſon ſpeaks during inſpiration, the voice is thereby very materially altered; and, by practice, may be made to appear as coming from other places than the mouth of the ſpeaker; as is the caſe with thoſe who call themſelves *Ventriloquiſts*.

OF THE THORAX.

THE *Thorax*, or *Breaſt*, extends from the neck to the Diaphragm, and is divided into *External* and *Internal* Parts.

EXTERNAL PARTS OF THE THORAX.

The *External* Parts of the Thorax, beſides the common Integuments and Mammæ, are,

The *Muſcles*, conſiſting of the *Pectorales*, *Subclavii*, and under end of the *Platyſma Myoides* on each ſide, which are ſituated anteriorly.

The *Serrati Magni*, which are placed laterally.

The *Trapezii*, *Latiſſimi Dorſi*, and numerous other Muſcles on the Back, which are placed poſteriorly.

The *Intercoſtales* and *Sterno-Coſtales*, which are ſituated, the former between, and the latter on the inner ſide of the Ribs.

The *Bones*, conſiſting of *Sternum*, *Ribs*, and *Dorſal Vertebræ.*—All theſe Parts, excepting the Mammæ, have been already deſcribed.

MAMMÆ.

The *Mammæ* are two Glandular Bodies, of a circular form, ſituated on the anterior, and a little towards the lateral parts of the Thorax, adhering looſely by Cellular Subſtance to the Surface of the large Pectoral Muſcles.

The term *Mammæ* is peculiar to the Breaſts of Women.—In Men theſe parts are called *Mammillæ* ;—and in the Brute-kind, *Ubera.*

In the *Ape*, and a few other animals, they are placed, as in the Human body, upon the Thorax ;—but, in the generality of Quadrupeds, they are ſituated under the Abdomen.

The common number of the Mammæ, in the Human ſpecies, is well known to be two.—BARTHOLINE, however, mentions the caſe of a Woman, who had two Mammæ on the left ſide, and one on the right ; and another, where there were two on each ſide.

Dr

Dr Vaughan narrates, the cafe of a Woman he has examined, who has a fupernumerary Nipple, at the under fide of the right Mamma, from which milk flowed when the central one was preffed, and *vice verfa.*

The Mammæ vary in fize in different Women, and in the fame Women at different periods of life.

In Girls, previous to the age of Puberty, they are remarkably fmall.

About the age of fourteen, at which time the Menfes, in this climate, moft commonly begin to appear, they evolve and become prominent.

During Geftation they increafe in fize, and foon after Delivery they arrive at their greateft extent.

After the age of forty-five, or from that to fifty,—the period when the Menfes generally difappear, they decreafe in fize, and become foft, pendulous, and flaccid.

Under the Skin, there is a large quantity of *Fat*, which conftitutes a confiderable portion of the bulk of the Mamma, and defends the Glandular Part, and is not found to pafs into, or communicate with, the Lactiferous Ducts.

The *Glandular* Part of the Mamma is of a whitifh colour, of the Conglomerate kind, and therefore irregular in its Subftance.

It is compofed of a number of fmaller Maffes or Glands, which are alfo feparated by Fat; and thefe again are divided into ftill fmaller parts, in which the Milk is originally fecreted or formed.

Near the centre of the Mamma, is the *Papilla* or *Nipple*, which is of a Cylindrical form, and of a redder colour than the reft of the Skin of the Breaft.

It is of different fizes in different ages and conftitutions, and is always larger in the time of Geftation, or of Nurfing.

It is capable of diftenfion from titillation, or when influenced by the paffions of the Mind.

It is compofed of a *tough Cellular* or *Ligamentous Subftance*, which inclofes the Lactiferous Tubes, and which is fo elaftic, that after the part is drawn out or diftended, it readily recovers its former dimenfion, when the caufe of diftenfion has ceafed to act.

Upon the Apex of the Nipple, the *Orifices* of the Lactiferous Ducts appear, and are of the fame number with thofe which enter its Bafe.

Around the Nipple, there is a *Circle* or *Difk*, called

Areola,

Areola,—of a different colour from the reſt of the Skin of the Breaſt.

This Diſk, however, varies in colour at different times of life,—being florid in young Girls, of a pale-brown in Women a little more advanced in life, and in old age, of a livid and dull colour.

During Pregnancy, it is of a darker colour than at other times, in conſequence of a change which takes place in the Corpus Mucoſum which forms it.

Under the Skin of the Areola, there are numerous *Sebaceous Glands*, or *Follicles*, the Orifices of which diſcharge an oily Mucus, to defend the Nipple and Areola around it.

The *Arteries* of the Mamma are partly from the Internal, and partly from the External Mammaries or Thoracics, the former of which are ſent off from the Subclavian, and the latter from the Axillary Artery,—the Branches entering the Mamma at many different places.

The *Veins* accompany the Arteries, and are diſtinguiſhed by the ſame names.

The *Abſorbents* of the Mamma are alſo numerous, the greater part of which paſs through the Axillary Glands, others penetrate the Interſtices of the Ribs, near the Sternum, and enter the Glands which belong to the Internal Mammary Veſſels.

The *Nerves* are chiefly from the Axillary Plexus, a few Branches being alſo ſent off from the Intercoſtals.

From the extremities of the Arteries in the Subſtance of the Mamma, numberleſs Tubes ariſe, called *Ductus* or *Tubuli Lactiferi*, which gradually unite into Trunks, and run in a radiated manner towards the root of the Nipple.

They become greatly enlarged in the time of Suckling, and ſerve as Reſervoirs in which the Milk is contained.

The Lactiferous Ducts are accompanied, in the Subſtance of the Mamma, by a *tough white elaſtic Subſtance*, which follows them to the Nipple.

At the root of the Nipple, they become contracted, and are there from *Twelve* to *Eighteen* in number.

Either from the want of uniformity, however, with reſpect to their number in different ſubjects, or from the difficulty of perceiving them, they have been variouſly eſtimated by different Authors.

Near the root of the Nipple, they have been ſuppoſed by Dr Meckel, to form a circle of communication;—

but

but this has been afcribed, by ftill later Anatomifts, to a laceration of Veffels; and numerous preparations and experiments,—particularly that of throwing in an injection at one Duct, and finding that it fills one part only of the Mamma, without returning by any other Duct,—feem fufficiently to indicate, that there is no fuch circular communication.

In the Subftance of the Nipple, the Lactiferous Tubes are at a little diftance from each other, and are coiled up in fuch a manner, that the fpontaneous flow of the Milk is prevented, unlefs it be accumulated in a large quantity.

But when the Nipple is drawn out and extended,—as by the application of the Child's Mouth,—the Ducts become ftraight and parallel to each other, fo as to allow an uninterrupted flow of the Milk.

After the action of Sucking, the Nipple, and of confequence its Ducts, immediately recover their former fituation.

Sometimes one or more of the Lactiferous Ducts terminate upon the Surface of the Areola, from which, MORGAGNI fuppofed, that the Glands there were of the Lactiferous kind.

In Children of both fexes, the Mammæ are merely Cutaneous Tubercles, and at the time of birth contain a *Milky-like Fluid*, which can be readily fqueezed out.

This Fluid commonly difappears a fhort time after Birth;—but there are various examples on record, where Milk has been brought to the Breafts, both of young Girls and old Women, by the frequent application of a Child to the Nipples, and where there was no caufe for fufpicion of Impregnation being prefent. Nor are inftances awanting of Milk being brought to the Mammillæ of Men, by the fame application.

The Mammæ add much to the ornament of the perfon, but ferve in particular for furnifhing nourifhment to the Child, which is conveyed to it through the medium of the Nipple.

The Secretion begins foon after Delivery, and continues to flow for many months, and even for fome years, if the Woman fuckle her Child; and the more frequently the Milk is extracted, the greater is the quantity received in a given time.

The operation of Sucking depends upon the principles of the Air-pump.—The child embraces the Nipple clofely with

with its Lips, which prevents the external Air from entering, draws the Ducts to a ſtraight line, and prepares a ſpace for the Milk, which is forced from the Breaſt by the preſſure of the Atmoſphere, and flows to the Mouth in the manner a Fluid follows the Piſtern of a common Pump or Syringe.

INTERNAL PARTS OF THE THORAX.

The Mammæ and Muſcles, covering the fore and lateral parts of the Thorax, being turned aſide, and the Ribs afterwards cut from the Sternum and turned back, the *Internal Parts* of the Thorax are brought into view.

They conſiſt of the *Pleura*, which lines the Thorax;—the *Mediaſtinum*, which divides it into right and left Cavities, and contains ſeveral Veſſels, Nerves, &c. between its Layers;—the *Pericardium* and *Heart*, which occupy the middle;—and the *Lungs*, which ſurround the Heart, and fill the greater part of the Thorax.

The Pleura.

The *Pleura* is a Membrane of conſiderable ſtrength, which lines the inner ſide of the Thorax, and covers the moſt of its contents.

Its External Surface is *Cellular*, and adheres cloſely to the parts which ſurround it.

Its Internal Surface is *ſmooth* and *poliſhed*, being moiſtened by a Serous Fluid, which exſudes from its Arteries.

It is divided into *two lateral Sacs* or *Pleuræ*, the form of which correſponds exactly with that of the ſurrounding Bones of the Thorax,

The Pleuræ adhere to the Perioſteum of the Ribs, line the Intercoſtal and Sterno-Coſtal Muſcles, the Sternum, and Dorſal Vertebræ, and cover the Pericardium, Lungs, and Lateral or Fleſhy parts of the Diaphragm.

Behind the Sternum, the Pleuræ are contiguous to each other, and form a *Partition* called *Mediaſtinum*, which extends between the Sternum and Vertebræ, but is intercepted by the Heart and Root of the Lungs, and divides the Thorax into two diſtinct Cavities, which have no communication with each other.

The *Arteries* of the Pleura are from thoſe of the adjacent parts, viz. from the Intercoſtal, Mammaries, Diaphragmatics, Bronchial, and Eſophageal.

The

The *Veins*, which return the Blood, accompany the Arteries, and are diſtinguiſhed by the ſame names.

The *Nerves* are from the Intercoſtals and Diaphragmatics, but too ſmall to be traced without difficulty; and the Membrane itſelf is not obſerved to poſſeſs much ſenſibility in the ſound uninflamed ſtate.

The Pleura ſerves to render the inſide of the Thorax ſmooth, for the eaſy motion of the contiguous parts, to divide it into Cavities, and to ſtrengthen the containing and contained parts of the Thorax.

Mediastinum.

The *Mediaſtinum*, ſo named from its ſituation in the middle of the Thorax, is formed by a reflection of the Pleura, and is of courſe double.—It contains between its Layers a conſiderable quantity of Cellular Subſtance, by which they are united.

It is divided into *Anterior* and *Poſterior* Mediaſtinum, the former of which is ſituated at the fore, and the latter at the back-part of the Thorax.

The *Anterior Mediaſtinum* is connected before, to the Sternum; and behind, to the Pericardium and large Veſſels of the Heart.

The two Layers of the Anterior Mediaſtinum are cloſely applied to each other, excepting at the upper part of the Thorax, where they are ſeparated by the remains of the *Thymus Gland*.

At the upper part of the Thorax, it lies exactly behind the middle of the Sternum; but in its deſcent, it inclines gradually to the left edge of that Bone.

In conſequence of its obliquity, a pointed inſtrument, puſhed through the centre of the Sternum, is generally found to paſs into the right Cavity of the Thorax.

Frequent deviations, however, from this general rule, have been met with.—In particular, Lieutaud and Sabatier relate ſeveral inſtances where the Anterior Mediaſtinum was found to deſcend along the middle of the Sternum; and others, though rare, where it deſcended even to the right ſide of this Bone.

The *Poſterior Mediaſtinum* reaches from the root of the Lungs and back-part of the Heart, to the Dorſal Vertebræ.

Between the Layers of the Poſterior Mediaſtinum, a *triangular ſpace* is formed, in which are ſituated the under end of the Trachea, the Eſophagus, the Aorta Deſcen-

 dens,

dens, the Vena Azygos, and Thoracic Duct, with the Eighth Pair of Nerves.

The *Blood-vessels* of the Mediastinum are from those of the neighbouring parts :—The Anterior Mediastinum is supplied by Branches from the Subclavian, Internal Mammaries, and Diaphragmatics,—and the Posterior Mediastinum, by Branches from the Intercostals and Esophageals.

The *Veins* accompany the Arteries, and have the same names.

The Mediastinum divides the Thorax into two Cavities, supports its general Contents, hinders one Lung from pressing upon the other, when the person lies on his side, and prevents Fluids,—which, in consequence of accident or disease, may be contained in the Cavity of the Thorax,—from passing from one side to the other.

Pericardium.

The *Pericardium*, *Sac*, or *Capsule* of the Heart, is one of the strongest Membranes of the Body, and its size such as to be properly adapted to that of the Heart, which it contains.

It is formed of *two Layers*, the *External* of which is a continuation of the Anterior Mediastinum, which afterwards passes to the Lungs and lateral parts of the Diaphragm.

The *Internal Layer* is smooth, tendinous-like, and polished on its inner Surface, and is stronger than the other.

It adheres so firmly to the Tendinous part of the Diaphragm, as not to be separated from it without much difficulty.

The Pericardium extends a considerable way beyond the Base of the Heart, and includes the large Blood-vessels, as far as the roots of their first principal Branches, in consequence of which it forms several angles, which have been termed *Cornua* of the Pericardium.

While the External Layer is reflected to cover the parts which surround it, the inner one is also reflected, first over the roots of the large Blood-vessels, and then over the Heart, to form its proper covering, in the same manner the Tunica Conjunctiva is reflected from the Eye-lids to cover the fore-part of the Eye.

From the ends of the Extreme Arteries, upon its Surface,

face, a Fluid, called *Liquor Pericardii*, is difcharged, by which it is lubricated, and the effects of Friction diminifhed.

The Liquor Pericardii is commonly found, after death, in the quantity of a few drachms, though not unfrequently of one or two ounces.

Its colour is redder in a young fubject, than in a perfon advanced in life, in whom it becomes paler, or more of a ftraw-colour.

The *Arteries* of the fore-part of the Pericardium are from the Internal Mammaries and Diaphragmatics; thofe of its fore-part from the Bronchial and Efophageal.

The *Veins* correfpond with the Arteries, and have the fame name.

The *Ufe* of the Pericardium is, to preferve the Heart in fitu, to defend it from being injured by the parts which furround it, and to reftrain its inordinate motions.

OF THE HEART.

THE *Heart* is a hollow Mufcle, divided into different Cavities, and inclofed in the Pericardium.

It is fituated in the Cavity of the Thorax, behind the Sternum, between the Right and Left Lungs.

It is of a *Conical* figure, flattened at one fide, and is divided into *Bafe*, *Body*, and *Apex*, with a *Superior* and *Inferior Surface*, and a *Right* and *Left Margin*.

The *Bafe* is placed backwards next the Spine, while the Body and Apex are turned forwards, and obliquely over to the left fide.

In Quadrupeds, the Heart is placed upon a line with the Sternum, the point only touching the Diaphragm:—In the Human Body, the Apex, or Point of the Heart, is but a little lower than the Bafe, and projects between the two lobes of the left Lung, behind the Cartilages of the Fifth and Sixth True Ribs of the left Side, or a little below the left Nipple, where the Pulfation may be felt.—The fituation, however, varies a little, according to the pofition of the Body, and ftate of Refpiration.

Though this be the common fituation of the Heart, a few rare and fingular inftances have occurred, where it

has

has been found to occupy the right ſide of the Thorax ; and a diſplacement has ſometimes happened, in conſequence of different kinds of tumours in the left ſide of the Thorax.

The *Superior* or *Anterior Surface* of the Heart is convex, and is oppoſed to the Poſterior Surface of the Sternum, the anterior edges of the Lungs intervening.

The *Inferior* or *Poſterior Surface* is flat, and reſts upon the Tendon of the Diaphragm, which ſupports it ; the Heart is not much affected, however, by the motions of that Muſcle in time of Reſpiration, its Tendon moving only in a ſmall degree.

The right ſide of the Body of the Heart is ſharp, and is called *Margo Acutus.*

The left ſide of the Body of the Heart is round, and is termed *Margo Obtuſus.*

The Baſe is formed of a right and left *Auricle*, and the Body of a right and left *Ventricle.*

When the Heart is diſtended, the right Auricle, and part of the correſponding Ventricle, occupy the right, and the reſt of the Heart the left Cavity of the Thorax.

The Heart is connected above and behind to the upper and back-part of the Thorax, through the medium of the *great Veſſels* which go into, or paſs out from it.

The other parts of the Heart are free, being merely contiguous to the inſide of the Pericardium.

The External Surface of the Heart is covered with a thin ſmooth *Membranous Coat*, which is a reflection of the inner Layer of the Pericardium, and which gives additional ſtrength to its Fleſhy Fibres.

Between the Coat and Subſtance of the Heart, there is commonly a conſiderable quantity of *Fat*, which lubricates it, and facilitates its motions.

The Subſtance of the Heart conſiſts of *Muſcular Fibres*, firm and more cloſely connected than the generality of Fibres of Muſcles in other parts of the Body.

The Fibres run in different directions, longitudinal and tranſverſe, but moſt of them oblique.

Many of them run over the Point of the Heart from one Surface to the other, and the whole ſo much twiſted and folded, and ſo variouſly intermixed, as to be difficult to be unravelled or deſcribed :—In general, however, their courſe is ſuch as to leſſen the Cavities of the Heart in all their dimenſions.

The *Cavities* of the Heart are lined with a Membrane extremely

extremely thin, but denſe and ſtrong, to defend them againſt the preſſure of the Blood.

The Heart is formed of an *anterior* or *right*, and a *poſterior* or *left* ſide, or of a *right* and *left Heart*, joined together by a *Partition*, which prevents the two ſides from having any direct communication with each other.—The terms Right and Left, however, are more applicable to the Heart of the Quadruped, and thoſe of Anterior and Poſterior to the Human Heart.

Each ſide of the Heart is furniſhed with a ſet of *Veins*, with an *Auricle*, a *Ventricle*, and an *Artery*, and alſo with two ſets of *Valves*,—one between the Auricle and Ventricle, the other between the Ventricle and Artery.

At the right ſide of the Heart are two Veins, called from their large ſize *Venæ Cavæ*, the one *Superior*, the other *Inferior*.

The *Superior Vena Cava*, called alſo *Vena Cava Deſcendens*, returns the Blood from the upper parts of the Body; and the *Inferior Vena Cava*, termed likewiſe *Aſcendens*, returns it from the lower parts; and both terminate in the right Auricle. It is prevented from returning by the fullneſs of the Veins, and by the preſſure of the Blood *a tergo*.

The Auricle is ſituated upon the right, and partly upon the back part of the Heart, and is divided into the right *Sinus Venoſus* and *proper Auricle*.

The *Sinus Venoſus* is formed by the union of the two Venæ Cavæ, which ſwell out towards the anterior and left ſide. It is notched at its anterior edge, is a Muſcular Bag of conſiderable ſtrength, and is uniform and ſmooth, both upon its outer and inner Surface.

At the upper and left ſide of the Sinus, is the projection or *Appendix*, terme'd *Proper Auricle*, from its ſuppoſed reſemblance to the Ear of a Quadruped:—It is formed by a blind Sac, which is ſerrated and notched on its poſterior edge, and convex or rounded on the other, and terminates obliquely in an obtuſe point.

The Sinus and proper Auricle form one common Cavity, have no Valve between them, and are therefore filled and emptied at the ſame time.

Where the two Cavities meet in the Hearts of Quadrupeds, there is a Projection ſeen in the Sinus Venoſus, called *Tuberculum* LOWERI, which is ſuppoſed to prevent the Blood of the one Cava from ruſhing upon that of the other, and to direct it into the Auricle.

 At

At the meeting of the two Cavæ in the Human Heart, an angle is formed, which also has frequently got the name of Tuberculum LOWERI:—That substance, however, is peculiar to the Hearts of Brute-Animals.

Under this Angle, or joining of the Venæ Cavæ, there is the Vestige of the *Foramen Ovale*, which, in the Fœtus, forms a communication between the right and left Auricles; but, in the Adult, is filled up by its Membrane, and forms the *Fossa Ovalis*.

The *Fossa Ovalis* has thick and strong sides, called *Columnæ Foraminis Ovalis*, *Isthmus* VIEUSSENII, or *Annulus Fossæ Ovalis*.

At the left side of the Mouth of the Inferior Cava, where it joins the Sinus, is the *Valve of* EUSTACHIUS.

It is in form of a Crescent, with the convex edge fixed to the union of the Sinus and Cava, and the concave edge turned obliquely upwards, reaching about half-way over the Mouth of the Cava.—Its size and appearance, however, vary much in different Subjects.

Its posterior Cornu is continued with the left side of the Isthmus of the Foramen Ovale; the other end vanishes in the opposite side of the Sinus.

It is equally distinct in the Adult as in the Fœtus; but in the former it is frequently found reticulated, or Cribriform, which appearance is seldom, though sometimes, met with in the latter.

In the Adult, it is supposed to prevent the Blood of the Auricle from passing into the Inferior Cava; and in the Fœtus, to direct the Blood of the Inferior Cava to the Foramen Ovale.

Upon the left side of the Valve of EUSTACHIUS, in the under part of the Auricle, is the *Orifice* or *Termination* of the great Coronary Vein of the Heart.

Over the Orifice of this Vein, there is a Semilunar Valve, to prevent the Blood in the Auricle from passing into the Vein.

The inner side of the proper Auricle is readily distinguished from the Sinus, by having a number of *Columnæ Carneæ*, or *Fleshy Pillars* in it, which, from their supposed resemblance to the Teeth of a Comb, sometimes obtain the name of *Musculi Auriculæ Pectinati*.

The Musculi Pectinati have smaller Columns running in different directions, giving the whole a reticulated appearance.

Between the Columnæ Carneæ, are *Depressions* or *Fur-*

rows,

rows, in which the ſides of the Auricle are thin, and ſemi-tranſparent, being chiefly formed by the outer and inner Membrane of the Auricle.

At the under and left ſide of the Sinus Venoſus, and oppoſite to a *Groove*, ſituated externally between the Auricle and Ventricle, there is a *Hole*, above an inch in diameter, which opens into the upper and right part of the correſponding Ventricle.

The right Auricle receives the Blood from the Venæ Cavæ and Coronary Veins, and, by its Muſcular contraction, diſcharges it into the correſponding Ventricle, out of which it is prevented from returning by a Valve, called *Tricuſpid*, placed within the Ventricle.

The *Right* or *Pulmonary Ventricle*, is ſituated on the fore-ſide of the Heart, is of a triangular form, and much thicker and ſtronger than the correſponding Auricle.

It has many ſtrong Eminences, Columns, Lacertuli, or Cords, called *Columnæ Carneæ*.

The *Columnæ* run in different directions, but the ſtrongeſt of them longitudinally, and are of various ſizes, forming ſo many diſtinct Muſcles, which are extremely compact in their ſtructure, and compoſe a beautiful, intricate, and irregular Net-work.

In general, they adhere through their whole length to each other, or to the ſides of the Ventricle; but many of them are looſe in their middle, and may be raiſed by a probe put under them.

They aſſiſt the Ventricle in its *Syſtole* or contraction, and prevent it from being overſtretched in its *Diaſtole* or dilatation, and agitate the Blood in its paſſage through the Ventricle.

They are ſuppoſed to bring the oppoſite ſides of the Ventricle completely together, during its contraction.

Between the Columnæ are many deep Grooves, Pits, or Foveæ, into all of which the Blood readily enters.

Around the Paſſage, between the Auricle and Ventricle, there is a *Tendinous Margin* or *Ring*, from the whole edge of which a circular Membrane is ſent off, called *Valvula Tricuſpis*, or *Triglochin*, from its having three principal points or diviſions.

From the edge of the Tricuſpid Valve, many ſmall round *Tendinous Cords* are ſent off, of unequal ſize.

The *Chordæ Tendineæ* deſcend obliquely within the Ventricle, in the ſame direction with the Valve from which they ariſe.

They

They are fixed to the extremities of a few ſtrong Papillæ or Columnæ Carneæ, which are joined by their other extremities to the correſponding ſides of the Ventricle.

The Tricuſpid Valve prevents the reflux of the Blood to the Auricle, during the contraction of the Ventricle.

The Tendons allow the Valve to be puſhed back by the Blood, until a Septum or Partition is formed by it at the Mouth of the Ventricle, during the contraction of the latter.—The Papillæ, by their contraction, prevent the Valve from going into the Auricle.

The Valve is opened and preſſed back by the Blood in its paſſage from the Auricle to the Ventricle.

The upper and left ſide of the Ventricle becomes ſmooth and uniform, and leads to a large Opening, about an inch in diameter, which is the Mouth of the Pulmonary Artery.

The right Ventricle, by its dilatation, receives the Blood from the Auricle, and ſends it, by a ſtrong and ſudden convulſive contraction, to the Pulmonary Artery, from whence it is prevented from returning, by three Valves placed in the Mouth of the Artery.

The Valves at the Mouth of the Pulmonary Artery are called *Valvulæ Semilunares*, or *Sigmoideæ*, from the reſemblance of their edges to thoſe of a Creſcent.—Two of them are placed in the fore, and one in the back-part of the Artery.

Each of them forms a *ſmall Sac*, one edge of which adheres to a third part of the circumference of the inſide of the Artery; the other edge is looſe in the Cavity of that Veſſel, and is ſomewhat thicker and ſtronger than the reſt of the Valve,—the thickened edges ſerving as Ligaments to it.

The looſe edge has a *general Curve*, divided into *two ſmaller ones*, which meet in a *point* in the middle.

The Valves are chiefly formed of a doubling or extenſion of the inner Coat of the Artery.

In the middle point, or looſe edge of each of the Valves, there is a ſmall hard *triangular Granula*, of a ſomewhat redder colour than the reſt of the Valve, called, from its reputed diſcoverers, *Corpuſculum* AURANTII, or *Corpuſculum* MORGAGNI; or, from its reſemblance in ſhape to the Seſamum ſeed, *Corpuſculum Seſamoideum*

The Corpuſcles complete the Valves at the centre of the

the Artery, and enable them to make a ſtronger reſiſtance againſt the Blood, while the Artery is in action.

The Semilunar Valves are *concave* towards the Artery, *convex* towards the Ventricle, and, when ſhut, their looſe edges are oppoſed to each other, ſo as to enable them to form a complete *Partition* between the Ventricle and Artery.

Oppoſite to the Semilunar Valves, the Artery bulges out, and forms *three Projections*, which have correſponding Pits or Depreſſions within, and are called, from their diſcoverer, *Sinus* VALSALVÆ.

The *Sinuſes* of VALSALVA are of the ſame nature with thoſe Dilatations which are found in the Veins and Lymphatics, between their ſides and Valves; and, like them, are partly formed by the preſſure of the Fluids upon the ſides of the Veſſels.

The Pulmonary Artery receives the Blood from the right Ventricle, and by its contractile power, aſſiſts the Ventricle in driving it through the Lungs.

The Semilunar Valves, preſſed back by the Blood in the Artery, prevent its return into the Ventricle.

The Valves are opened again by being driven towards the ſides of the Artery by the current of the Blood, upon the next contraction or ſtroke of the Ventricle.

The Pulmonary Artery paſſes behind the Sternum, and ſeparates into *right* and *left Branches*, which go to the correſponding parts of the Lungs.

The two Branches of the Pulmonary Artery, like thoſe of the Arteries of the Viſcera in other parts of the large Cavities, ſuddenly divide into ſtill ſmaller Branches.

From the extreme Arteries of the Lungs, correſponding Veins ariſe, and are merely the continuation or reflection of the Arteries, without any intermediate Cells or Dilatations.

The Pulmonary Veins, in the Subſtance of the Lungs, gradually unite, and form *four principal Trunks*, which terminate in, and carry the Blood to the left Auricle.

Of the Pulmonary Veins, *two* come from the right, and *two* from the left Lung, and terminate in the correſponding ſides of the left Auricle.

The *left Auricle* is conſiderably thicker and ſtronger than the right, and, like it, is divided into Sinus Venoſus and proper Auricle, which form one common Cavity without the intervention of any Valve.

The *left Sinus Venoſus*, called alſo *Sinus Pulmonalis*, is turned

turned towards the Spine, is more of a cubic form than the right one; but refembles it in the uniformity and fmoothnefs of its outer and inner Surfaces.

From the fore and left part of the Sinus, the *Proper Auricle* projects, and forms a diftinct flat *Appendix*, or *Bag*, with different Curvatures or Indentations upon its edges.

The inner part of the Proper Auricle is *longer*, but *narrower* than that on the right fide; like it, however, it is formed of Columnæ Carneæ, with Furrows between them.

The Proper Auricle is fomewhat lefs capacious than that on the right fide; but the Sinus is as much larger as to render the two common Cavities of the right and left Auricles nearly equal.

The two Auricles have a *Flefhy Septum* between them, in which, as has been already mentioned, there is the *Foramen Ovale* in the Fœtus;—but in the Adult the Partition is generally perfect.

From the under part of the Sinus Venofus, a *Paffage* leads down to the Cavity of the Left Ventricle, and is oppofite to a *Groove* feen externally between the Auricle and Ventricle, fimilar to that on the right fide.

The Left Auricle receives the Blood from the Pulmonary Veins, and by its Mufcular contraction, drives it into the Left Ventricle, from which it is prevented from returning, by a Valve in the Ventricle, called *Mitralis.*

The *Left Ventricle* is fituated in the pofterior and left part of the Heart.

Its fides are about *three times thicker* and *ftronger* than thofe of the Right Ventricle, being in proportion to the force required to propel the Blood to the moft remote parts of the Body.

It is *narrower* and *rounder*, but confiderably *longer*, both on its External Surface and in its Internal Cavity, than the Right Ventricle, and generally defcends fomeway below the other, and forms the Apex Cordis, or Point of the Heart.

The Cavity is commonly defcribed as being lefs than that of the Right Ventricle;—but the apparent difference, which takes place after death, is accounted for with feeming propriety by fome Authors,—from the left Ventricle being then for the moft part found empty, and the Right one full, and from the greater degree of contractility in the former.

That the capacity of the Cavity of the right and left Sides

Sides of the Heart is more nearly equal during life than after death, or than it is generally ſuppoſed to be, is evident from the appearance of the Heart of the Human and alſo of the Brute kind, and from injections into the two ſides of the Heart, where the force applied is in proportion to the relative ſtrength of each ſide.

The inner Surface of the Left Ventricle has the ſame general appearance with the Ventricle of the right ſide, and only differs from it in having its Columnæ Carneæ larger, firmer, and ſtronger.

In the Paſſage of communication between the Auricle and Ventricle, there is a *Ring*, from which a *Circular Valve* goes off, with all its apparatus ſimilar to that between the right Auricle and Ventricle, and differing in no reſpect from it in ſtructure and uſe, excepting in being ſtronger, and in being divided into two principal portions only.

This Valve has been ſuppoſed to bear ſome reſemblance to a *Biſhop's Mitre*, from which it has been called *Valvula Mitralis.*

One of the portions of this Valve is larger than the other, lies over the Mouth of the Aorta, and is ſuppoſed to cover it while the Ventricle is a-filling.

The *Valvula Mitralis* prevents the reflux of the Blood during the contraction of the Ventricle.

After the contraction is over, the Valve returns to its former ſituation by the impulſe of a freſh current of Blood from the Auricle.

Between the Right and Left Ventricle, there is a thick ſtrong impervious *Partition*, which forms a ſhare of the general Septum Cordis, and is compoſed partly by the wall of the Right, but chiefly by that of the Left Ventricle, the Right being united to the Left, almoſt in the form of an Appendix.

The Partition prevents any direct communication between the two Ventricles.

Oppoſite to the outer edge of the Septum, both upon the upper and under Surfaces of the Heart, there is a *Groove* in which ſome of the principal Trunks of the Coronary Veſſels are ſituated.

At the fore and right ſide of the Valvula Mitralis, and behind the beginning of the Pulmonary Artery, there is a *round Opening*, which is the Mouth of the Aorta, and which is nearly of the ſame ſize with that of the Pulmonary Artery.

Under this opening, the Surface of the Ventricle becomes *ſmooth* and *equal*, having none of the Columnæ Carneæ which are ſeen on the other parts of its Cavity.

The Left Ventricle receives the Blood ſent to it from the Auricle, and, by a contraction ſimilar to, but much ſtronger than that of the Right Ventricle, propels it to the Aorta.

At the Mouth of the Aorta, there are *three Semilunar Valves*, with their *Corpuſcula* AURANTII, perfectly ſimilar to thoſe of the Pulmonary Artery;—but a little ſtronger.

On the outſide of the Semilunar Valves, are the *Sinuſes* of VALSALVA, like thoſe of the Pulmonary Artery,—but a little more prominent.

The Semilunar Valves are preſſed back by the Blood, and prevent its reflux during the contraction of the Aorta.—They are returned towards the ſides of the Aorta, in the ſame manner, and from the ſame cauſe, as in the Pulmonary Artery.

The *Aorta* paſſes upwards from the top of the Left Ventricle, and is ſituated firſt behind, and then on the right ſide of the Pulmonary Artery, and between it and the Superior Cava.

It bears nearly the ſame proportion in thickneſs and ſtrength to the Pulmonary Artery, which the ſides of the Left Ventricle do to thoſe of the Right.

When the Aorta is about to ſend off the firſt of its large Branches at the top of the Thorax, it is of great ſize, and is ſometimes called the *Large Sinus* of VALSALVA.

The Aorta receives the Blood from the Left Ventricle, and by its Muſcular contraction re-acts upon it, and aſſiſts the Ventricle in ſending it by numberleſs Branches through the different parts of the Body, from whence it is returned by the Veins to the Right Auricle.

Beſides the Blood-veſſels already taken notice of, and which are common to the Heart and the reſt of the Body, the Heart is furniſhed with Veſſels peculiar to itſelf, termed *Coronary*, from a *Corona* which they form upon its Surface.

The Coronary Veſſels conſiſt of *two Arteries* and *one principal Vein*.

The *Coronary Arteries* ariſe from the Sinuſes, at the mouth of the Aorta, oppoſite to two of the Semilunar Valves.

One

One runs in a Groove between the Right Auricle and Ventricle, and ſupplies chiefly the right ſide of the Heart.

The other paſſes partly between the Left Auricle and Ventricle, and partly in the Groove between the Ventricles, on the fore-ſide of the Heart,—ſupplying the left ſide of the Heart, and communicating with the Branches of the other Artery on its upper and under Surfaces.

The Coronary Arteries are entirely diſperſed upon the ſubſtance of the Heart, and upon the roots of the great Veſſels, forming upon theſe ſome of the minute Branches, termed *Vaſa Vaſorum.*

The Coronary Arteries, from their ſituation oppoſite to the Valves, have been ſuppoſed to be filled at a different time from that of the reſt of the Arterious Syſtem;—but from experiment, it ſeems now ſufficiently evident, that the Coronary Veſſels have their pulſation at the ſame inſtant with the other Arteries.

The *Coronary Veins* return the Blood from their correſponding Arteries: The greater part of them join into a Trunk, called the *Great Coronary Vein*, which, after making a turn from the left ſide, and running between the Left Auricle and Ventricle, terminates in the under part of the Right Auricle, where it is covered by its Semilunar Valve.

Other Coronary Veins, much ſmaller than the former, terminate in different parts of the right ſide of the Heart.

The *Abſorbents* of the Heart go to the neighbouring Lymphatic Glands.

The *Nerves* are from the great Sympathetics and Eighth Pair.

With reſpect to the Circulation in general:—The Veins return the Blood from all the different parts of the Body, by a ſlow and equal motion, and without pulſation, to the Auricles, which, on account of the quantity and ſtimulating quality of the Blood, contract ſuddenly and at the ſame time, and ſend it to the Ventricles.

The Ventricles, from the ſame cauſe which ſtimulates the Auricles, and from the ſtroke they receive from them, contract convulſively, with a force proportioned to the thickneſs of their ſides, and ſend the Blood to the Arteries; and, during their contraction, they are thrown by the dilating Auricles againſt the Ribs, where the ſtroke occaſioned by the Pulſe of the Heart may be felt.

 The

The Arteries, by their contractile power and elasticity, send the Blood suddenly to the Veins, through which, by the united force of the Ventricles and Arteries, and likewise, as is supposed by some, by a contractile power of the Veins and pressure of the surrounding parts, it is driven again to the Auricles.

In its course, the Blood performs a double Circulation,—one called the Lesser, or that through the Lungs; —the other called the Greater, or that through the Body.

In the former, it passes from the Right Ventricle to the Lungs, and returns to the Left Auricle.—In the latter, it goes from the left Ventricle to the different parts of the Body, and returns to the Right Auricle.

During this Circulation, the Auricles and Arteries, and the Ventricles and Veins, act in concert, contracting and dilating at the same time.

Use of the Heart.——The Heart is the centre of the Vascular System, and the principal agent in the Circulation of the Blood.

The right side of the Heart receives the Blood, which is contaminated in passing through the Body, and sends it to the Lungs, where it is purified through the medium of the Air.

From the Lungs, the Blood, now purified, is returned to the left side of the Heart, to be circulated through all the other parts of the Body, thereby imparting Nourishment, Growth, and Strength to the general System; being found also to be the source of Sensibility, Irritability, and Motion, and likewise of the Animal Heat.

OF THE LUNGS.

The *Lungs* are two soft spongy bodies, which occupy by much the greater part of the Cavity of the Thorax.

They completely fill the two bags of the Pleura, and are every where in contact with the parts adjacent; no Air intervening between them and the Thorax.

In *figure*, they have been compared to that of the Foot of

of an Ox, with the back-part turned forwards;—or, their ſhape correſponds exactly with the inſide of the Thorax, being rounded next the Ribs, hollow towards the Diaphragm, and irregularly flattened and depreſſed next the Mediaſtinum and Heart.

They are of a reddiſh or pink colour in Children, of a light blue or greyiſh colour in Adults, and more of a purple and livid colour in Old Age, at which period they are alſo obſerved to be tinged with black ſpots, proceeding from a matter ſecreted in their Subſtance.

They are joined to the Neck, by the Trachea; to the Spine, by the two Layers of the Mediaſtinum, which ſerve them as Ligaments; and to the Heart, by the Pulmonary Veſſels;—the reſt of them being free and unconnected, unleſs an adheſion has taken place in conſequence of inflammation.

They are divided into *Right* and *Left Portions*, or *Lungs*, which are ſeparated from each other by the Heart and Mediaſtinum, and which have no communication, excepting through the Medium of the Trachea.

Each of the Lungs is again divided into large portions, called *Lobes*, which facilitates their motion and the dilatations of their Cells.

Of theſe Lobes, *three* belong to the Right Lung, correſponding with the larger Bag of the Pleura, and *two* to the Left, between which there is a Notch or Sinus, occupied by the Point of the Heart.

Each of the Lobes is ſubdivided into many ſmaller parts, termed *Lobules*, which are of different ſizes, and of an irregular angular form.

The Lobules diminiſh in ſize, and degenerate at laſt into ſmall *Veſicles* or *Cells*, which conſtitute a large ſhare of the Lungs, and which are merely viſible to the naked Eye.

The Cells of the Lungs are purely Membranous, of an irregular figure, compreſſed and cloſely connected, and have a free communication with each other.

Between the different Lobes, Lobules, and Cells, a large quantity of common Cellular Subſtance, deſtitute of Fat, is interpoſed, which unites and ſtrengthens them, and allows the Blood-veſſels to be minutely diſperſed over them.

The Cells of the Lungs have no communication with this common Cellular Subſtance; for when Air is blown

into it, the Lobules are compreſſed;—but when the Air is blown in through a Branch of the Trachea, the Cells are again diſtended, and the Lobules recover their former dimenſions.

In the Fœtus, the Cells are empty and in a collapſed ſtate;—but as ſoon as Reſpiration begins, they become diſtended, and continue ſo during life, and in every ſtate of Reſpiration, and even in the recently dead Body:— But if an opening be made into the Cavity of the Thorax, whether in the living or dead Body, and the Air in this or in any other way admitted, they immediately collapſe by their own weight and elaſticity, the preſſure of the Air being then the ſame on the outer Surface of the Lungs, and inner Surface of the Trachea.

The Lungs are covered by *two Coats*, an External or Common, and an Internal or Proper one.

The *External* or *Common Coat*, is a continuation or reflection of the Pleura, is extremely thin, but denſe, and, like the other parts of the Pleura, is found to poſſeſs little Senſibility. It forms a general covering to the Lungs, but does not enter between their different Lobules.

The *Internal* or *Proper Coat* adheres ſo firmly to the former, as to appear to conſtitute part of its Subſtance. It not only covers the Lungs, but inſinuates itſelf between their Lobules, and is intimately connected with their Cellular Subſtance.

Beſides the Cells, various kinds of Veſſels, viz. the *Air-veſſels* or *Branches of the Trachea*, *Blood-veſſels* and *Abſorbents*, together with ſmall Branches of *Nerves*, enter into the compoſition of the Lungs.

TRACHEA.

The *Trachea*, or *Aſpera Arteria*, ſo called from the inequality of its Surface, and from its conveying Air, begins at the under part of the Cricoid Cartilage, and deſcends in the fore part of the Neck, between and behind the Sterno-hyoid and Sterno-thyroid Muſcles.

From the Neck, it paſſes into the Thorax, where it is ſituated between the Layers of the upper part of the poſterior Mediaſtinum.

Behind the Curvature of the Aorta, and oppoſite to the

the third Vertebra of the Thorax, the Trachea divides into two Lateral Branches, termed *Bronchi*, from Βρογχοσ, the Windpipe, one of which goes to the Right, and the other, which is the longer of the two, to the Left Lung.

The Bronchi are divided into Branches, which by degrees become ſmaller, and at laſt terminate in the Cells of the Lungs, which communicate ſo freely with each other, that, upon introducing Air into any of theſe Branches, a large portion of the Lungs may be inflated.

The Trachea conſiſts of *Cartilaginous Rings*, about ſixteen or eighteen in number, which give ſtrength and firmneſs to it, and preſerve it conſtantly open for the tranſmiſſion of Air. They are incomplete behind, where the Trachea is formed of a *ſoft Fleſhy Subſtance*, which yields to the Eſophagus in the time of Deglutition.

Each Cartilage forms a large ſegment of a circle, about a line, or one twelfth of an inch in breadth, and one fourth of a line in thickneſs.

The Cartilages are ſituated horizontally, with their edges oppoſed to each other, ſmall ſpaces intervening between them.

They are united to each other, by a Ligamentous Subſtance, which is ſo elaſtic, that when the Lungs are taken out of the Body, it draws the Cartilages cloſely together.

At the upper end of the Trachea, two or three of the Cartilages are frequently joined by an union of Subſtance; but below this, they are perfectly diſtinct from each other.

The beginnings of the Bronchi have the ſame kind of Cartilages with the Trachea; but after they enter the Lungs, they are broken into two or three pieces, which go completely round the Bronchi, and are ſo connected to each other, as to keep the Paſſage open and free from compreſſion.

The Trachea has ſeveral *Coats* entering into its compoſition, ſome for ſtrengthening it, others for giving it a certain degree of motion, viz.

A *Cellular Coat*, which, in the Thorax, is covered by the Mediaſtinum.

An *Elaſtic Ligamentous Coat*, which paſſes along the Trachea, and alſo upon the different Branches in the ſubſtance of the Lungs, adding much to the elaſticity of theſe.

A *Muscular Coat*, placed between the Cartilages, and in the back-part of the Trachea, and composed of Circular Fibres without, and Longitudinal Fibres within;—the former for straitening, the other for shortening the general Passage.

The Longitudinal Fibres are collected into bundles, which are distinctly seen through the inner Coat, and may be traced considerably farther, in the Substance of the Lungs, than the Cartilages.

The inner side of the Trachea is lined with a very *Vascular and Irritable Membrane*, continued from the Mouth, and forming at last the extreme Branches of the Trachea, which terminate in the Cells of the Lungs.

The inner Membrane of the Trachea is every where perforated by the *Ducts* of *Mucous Glands*, and by the *Mouths* of the *Exhalent Arteries*, the former pouring out Mucus to lubricate the Lungs, the other the Vapour which is thrown off in Perspiration.

Three different kinds of Glands are connected with the Trachea,—the *Thyroid*, the *Tracheal*, and the *Bronchial*.

The *Thyroid Gland* has its name from its connection with the Thyroid Cartilage, though more immediately connected with the Trachea.

It is a large reddish mass, situated at the under and fore-part of the Larynx, behind the Sterno-hyoid and Sterno-thyroid Muscles.

It has two Lobes placed at the under and lateral parts of the Larynx, descending a certain way upon the Trachea and Esophagus.

The Lobes are joined by an intermediate portion, which lies across the upper and fore-part of the Trachea.

Sometimes a Process from the middle portion ascends between the Sterno-hyoid Muscles, and is lost behind the Base of the Os Hyoides.

This Gland has a Granulous appearance within, and a viscid Liquor is sometimes observed in it, which has been supposed by SABATIER and others, to lubricate the parts in the neighbourhood.

It is supplied with large Blood-vessels, and with several Nerves, from those of the Larynx; it is likewise furnished with numerous Lymphatics,—but no Excretory Duct has yet been observed to come from it; nor is its office yet understood.

The *Tracheal Glands* are small, but numerous, and of different

different ſizes, ſurrounding the Muſcular Coat of the Trachea, and its Branches in the Lungs;—the largeſt of them are placed in the Fleſhy Subſtance behind.

From each of theſe Glands a ſmall Duct iſſues, and throws out a Mucus, to defend the inner Surface of the Trachea from being injured by the Air, or by the extraneous particles which it carries along with it.

The *Bronchial Glands* are placed in the Cellular Subſtance round the under end of the Trachea and roots of the Bronchi, where theſe penetrate into the Subſtance of the Lungs.

They are of various ſizes, from that of the point of the Little Finger to that of a Millet-ſeed, and have a bluiſh or black colour, correſponding in a great meaſure with the colour of the darkeſt parts of the Lungs.

They were formerly conſidered by many Authors as ſending Fluids to the Trachea, but are now ſufficiently known to be entirely of the Lymphatic kind,—the Abſorbents of the Lungs paſſing through them in their way to the Thoracic Duct.

The Trachea is furniſhed with *Blood-veſſels* from the Inferior Laryngeals, and *Nerves* from the Recurrents and great Sympathetic Pair.

The Trachea ſerves to convey Air into, or out from the Cells of the Lungs, during Reſpiration, and to carry off the Perſpirable Matter from their Arteries in time of Expiration.

The *Blood-Veſſels* of the Lungs conſiſt of the *Pulmonary* and *Bronchial Veſſels*; the one for the general Circulation, the other proper to the Lungs.

The Pulmonary Artery ariſes from the top of the Right Ventricle, divides, like the Trachea, into Right and Left Branches, which are diſperſed through the ſubſtance of the Lungs.

The minute Branches running in the common Cellular Subſtance, form at laſt a *Plexus* upon the proper Cells, ſometimes called *Rete Mirabile*, and *Rete Vaſculoſum* Malpighii, from which that Halitus is derived which is expelled by the Lungs in Expiration.

The *Pulmonary Veins* are commonly obſerved to be ſmaller in proportion to the correſponding Arteries, than Veins are to Arteries in other parts of the Body, which has been ſuppoſed to be owing to the large quantity of Fluids expired.—They join into four principal Trunks, which terminate in the Left Auricle.

The

The *Bronchial Arteries* arise by three or four small Branches, one of which is from the right Superior Intercostal, the rest from the Trunk of the Aorta.

They are dispersed upon the Bronchi and Bronchial Glands, and substance of the Lungs in general, and are found to communicate with the Pulmonary Artery.

The Bronchial Arteries are supposed to serve for the nourishment of the Lungs and secretion of the Mucus.

The *Veins* return the Blood to the Vena Azygos, and left superior Intercostal Vein.

The *Lymphatics* form a Plexus upon the Surface of the Lungs :—They communicate freely with the deep-seated Absorbents, and pass through the Bronchial Glands.

The Nerves of the Lungs are partly from the great Sympathetics, but chiefly from the Eighth Pair, and are rather small in proportion to the bulk of the organ on which they are dispersed.

The Lungs serve the general purpose of *Respiration*, which consists of *Inspiration* and *Expiration*, or the passage of the Air into or out from the Lungs by the alternate dilatation and contraction of the Thorax.

Inspiration is performed in consequence of the Thorax being dilated by the action chiefly of the Diaphragm and Intercostal Muscles ; the Lungs, which are passive, and in contact with the Thorax, following it, and the Air rushing into the Trachea by its own gravity.

Expiration is performed in consequence of a relaxation of the Muscles which dilate the Thorax,—of the action of the Abdominal and a few other Muscles,—of the elasticity of the Cartilages of the Ribs, and likewise of the Lungs, by which the Cavity of the Thorax is diminished, and the Air is expelled from the Lungs.

Upon the alternate states of Inspiration and Expiration, depend the formation of the Voice, the sensation of Smell, and all the other functions of the Body :—But the great and principal office of the Lungs, which was formerly supposed to be that of cooling the Blood overheated by friction, is, during Inspiration, to receive from the Atmosphere pure Air, upon which the principle of heat and life depends ; and, during Expiration, to carry off an impure Air, which is noxious to Animal Life.

According to late experiments, it appears,—that the

Venous

Venous Blood passing to the Lungs, of a dark red or purple colour, is charged with Carbon or Charcoal, and Hydrogen, or Inflammable Air ;—that while circulating upon the Bronchial Cells, one part of the Oxygen, or Vital Air, contained in the common Air which has been inspired, unites with the Carbon and Hydrogen, and forms Fixed Air and a Watery Halitus, which are carried off by Expiration ;—that another part of the Oxygen is imbibed by the Blood, which, in consequence of these changes, returns from the Lungs, of a florid red colour, and full of heat in a latent state, which becomes sensible in the course of the general Circulation, and is diffused over the different parts of the Body ; and,—that the Blood thus changed also affords a Stimulus to the Arteries, and promotes the different Secretions.

Esophagus.

The Esophagus, called also *Gula* or *Gullet*, derives its name from carrying what is eaten into the Stomach.

It is a Fleshy Canal, which begins from the inferior part of the Pharynx, descends along the Neck, and through the Thorax, following nearly the direction of the Spine.

It is situated between the Trachea and Vertebræ ; and in the Thorax, it proceeds behind the Base of the Heart, and between the Layers of the Posterior Mediastinum, from which it receives a lateral covering.

Soon after entering the Thorax, it makes a slight turn to the right, and passes down upon the fore and right side of the Aorta, by which they are prevented from injuring each other.

In its progress, it inclines more forwards and to the left side ; and about the Ninth Vertebra of the Thorax, it perforates the Muscular part of the Diaphragm, and terminates in the upper Orifice of the Stomach.

It has several *Coats* proper to it, the first of which is *Cellular*, and connects it to the adjacent parts.

The second Coat is *Muscular*, and is sometimes termed *Vaginalis Gulæ*.—It consists of two Layers ; the external of which has thick, strong, longitudinal Fibres ; the internal is formed of circular and transverse Fibres, and is thinner

thinner than the former.—The outer Layer is fitted for ſhortening and relaxing, and the inner for contracting the Canal, during Deglutition.

The third Coat is termed *Nervous*, but is properly Cellular, being formed of looſe Cellular Subſtance, which connects the Muſcular to the Inner Coat.

The *Inner Coat* is continued from the Lining of the Mouth: It conſiſts of many longitudinal *Plicæ* or Folds, which are ſcarcely viſible when the Eſophagus is dilated, and is furniſhed with numerous *Foramina*, which diſcharge a Mucus, for lubricating the paſſage, and facilitating Deglutition.

The *Arteries* of the Eſophagus are Branches of the Inferior Laryngeals, which ſupply the Cervical part of it, and Eſophageals and Branches of the Bronchials, which are derived from the Aorta Deſcendens, and ſupply the Thoracic part of it.

The *Veins* go to the Inferior Laryngeals, to the Vena Azygos, and left Superior Intercoſtal Vein.

The *Abſorbents* are numerous, and intermix with thoſe of the Heart and Lungs.

The *Nerves* are chiefly from the Eighth Pair.

The *uſe* of the Eſophagus is, to receive the Aliments from the Pharynx, and convey them to the Stomach.

Thoracic Duct.

The Thoracic Duct is a ſmall Membranous-like Canal, ſituated in the back-part of the Thorax, and is the principal Trunk of the Abſorbent Syſtem.

It begins upon the third Vertebra of the Loins, and paſſes behind the Aorta, croſſing obliquely from left to right, till it gets to the right ſide of that Artery.

Upon the firſt Lumbar Vertebra, it forms an *Oval Sac*, termed *Receptaculum Chyli*, which is placed behind the Right Crus of the Diaphragm, and a little higher than the Right Renal Artery.

The Duct afterwards paſſes between the Crura of the Diaphragm, and aſcends in the Thorax, on the anterior part of the Spine, between the Layers of the Poſterior Mediaſtinum, on the right ſide of the Aorta, and between it and the Vena Azygos.

It croſſes behind the upper part of the deſcending Aorta,

Aorta, and emerges from the Thorax, to reach the under part of the Neck.

In the Neck, it paſſes behind the Internal Jugular Vein, and a little higher than the Subclavian.

It then turns downwards, forming an Arch, which terminates in the upper part of the Angle, between the Internal Jugular and Subclavian of the Left Side.

The Thoracic Duct receives the Chyle from the Lacteals, and Lymph from the Lymphatics, and diſcharges theſe into the red Veins.

OF

OF THE ABDOMEN.

THE *Abdomen* or *Belly* extends from the Thorax to the under part of the Trunk.

It is bounded above, by the Diaphragm, and the Bones to which that Mufcle is fixed; below, by the Pelvis; behind, by the Lumbar Vertebræ and Mufcles of the Loins; anteriorly, by its Proper Mufcles; and laterally, by the Falfe Ribs, Offa Ilii, and Mufcles connected with thefe;—all of which have been defcribed in their places.

It is diftinguifhed into *three Divifions* or *Regions*, termed *Upper*, *Middle*, and *Under* Region; each of which is fubdivided into three others.

The *Upper Region* begins oppofite to the Cartilago Enfiformis, at a fmall depreffion called *Scrobiculus Cordis*, or Pit of the Stomach, and extends to about a handbreadth from the Umbilicus or Navel.

The middle of this Region is termed *Epigaftrium*, or under part of the Belly, and the two lateral parts *Hypochondria*, from their lying under the Cartilages of the Falfe Ribs.

The *Middle Region* occupies an equal diftance above and below the Umbilicus.—The middle part of it is called the *Umbilical*, and its lateral parts the *Lumbar Regions* or *Loins*.

The *Under Region* begins where the middle one terminates, or at a line drawn between the fuperior anterior Spinous Proceffes of the Offa Ilii, and forms in the middle, the *Hypogaftrium* or bottom of the Belly; and at the fides, the *Iliac Regions*.

The Abdomen is covered on the outfide by the *common Integuments*, and lined within by the *Peritoneum*, in the manner the Thorax is lined by the Pleura, but without being divided by the intervention of a Partition.

The Abdomen contains the *Chylopoetic* and *Affiftant Chylopoetic Vifcera*, or *Orgns of Digeftion*,—the *Organs of Urine*, and *part of thofe of Generation*, with the *Veffels* and *Nerves*

Nerves which belong, ſome of them to theſe Viſcera, and others to the lower parts of the Body.

The *Chylopoetic Viſcera* comprehend the Stomach, which is ſituated in the upper and left part of the Abdomen,—the *Inteſtines*, which fill the greater part of it,—and the Membranes, termed *Omenta* and *Meſentery*, which are connected with theſe.

The *Aſſiſtant Chylopoetic Viſcera* conſiſt of the *Liver*, which is placed in the upper and right;—of the *Spleen*, which is ſituated in the upper and left ſide of the Abdomen;—and of the *Pancreas*, which lies under the Stomach.

Of the *Organs of Urine*, the *Kidneys* are placed in the back-part of the Abdomen, and the *Bladder*, with ſome of the *Organs of Generation* in the Pelvis.

Peritoneum.

The *Peritoneum*, named from its being ſtretched or ſpread around the Bowels, is a firm but ſimple Membrane, by which the Abdominal Viſcera are ſurrounded, and partly ſupported.

Its External Surface is rough and Cellular, and cloſely connected with the parts to which it belongs.

The Internal Surface is remarkably ſmooth, and lubricated by a Liquor which is exhaled from its own Veſſels.

It is very elaſtic, and admits of great extenſion, as happens in Geſtation, Corpulency, or Aſcites; but, upon the cauſes of extenſion being removed, it returns to its former dimenſions.

It lines the Diaphragm, paſſes downwards, adhering firmly to the Abdominal Muſcles,—lines the containing, and covers the contained parts of the Pelvis, from which it is reflected in the back-part of the Abdomen, lining its Muſcles, and, by its reduplications, covering the Bowels and great Blood-veſſels of that Cavity;—though, ſtrictly ſpeaking, the Abdominal Viſcera may be ſaid to lie on the outſide of it.

In its paſſage from one Bowel to another, it forms doublings which ſerve as Ligaments to fix them to each other, and likewiſe to the Body.

It gives a general covering to moſt of the Bowels, a partial one to a few, and to thoſe which are deep-ſeated, and project leaſt, a ſtill more partial covering.

It forms a large Sac, the posterior part of which adheres firmly to the different Viscera, and the anterior to the Abdominal Muscles ;—the part lining the Abdomen being merely in contact with its contents, and allowing a small degree of motion.

The Cellular Substance, on the External Surface of this Membrane, is not every where of equal thickness, being in some parts, as upon the Bowels, remarkably thin ; in others, as over the Kidneys, filled with a considerable quantity of Fat.

The Cellular Substance forms various Processes or productions, some of which, as those on the Spermatic Cords, pass through Foramina, to be connected with the neighbouring parts ; and the Processes are sent off, without affecting the Internal Membrane, the one not accompanying the other.

The *Vessels* and *Nerves* of the Periotenum are from those which supply the contiguous parts ; its Vessels, however, are not very numerous ; neither does it possess much Sensibility when free from disease.

The *Arteries* come from the Internal Mammary, Epigastric, Inferior Intercostal, Lumbar, Sacral, and Ileo-lumbar Arteries, and from those which supply the Abdominal Viscera.

The *Veins* have the same course, bear the same names, and in general pass to the Inferior Cava.

The *Absorbents* are numerous, and run chiefly to the Iliac and Lumbar Plexus.

The *Nerves*, which are few in number and small, are from the Inferior Dorsal, the Lumbar, the Great Sympathetic and Sacral Nerves.

The *use* of the Peritoneum is to line and strengthen the Cavity of the Abdomen ; to inclose and assist in supporting its different Viscera ; to furnish most of them with an External Coat ; to connect them to the Body, and, by its smoothness and slipperiness, to prevent the effects of Friction.

Upon the outside of the Periotenum are *Four White Lines*, or small Cords, three of which are Vessels in the Fœtus,—one of them a Vein, and two of them Arteries ; the fourth is the Urachus.—In the Adult, they are shrivelled up, and serve as Ligaments, the Vein forming the round Ligament of the Liver, the three other Cords, forming Ligaments of the Bladder.

STO-

STOMACH.

The *Stomach* is a large Bag or Reſervoir, ſituated obliquely acroſs the upper and left part of the Abdomen, in the left Hypochondriac and Epigaſtric Regions.

It is turned downwards and forwards, ſo as to form an angle with the Eſophagus, the angle becoming more conſpicuous, according to the diſtenſion of the Stomach.

The right part of the Stomach is ſituated under the left part of the Liver, the reſt of it is placed immediately under the Diaphragm, its extremity being in contact with the Spleen.

The Stomach is long, round, and tapering, and has been compared in ſhape to the Bag of a Bagpipe.

The ſize is in proportion to the quantity of Aliment it has been accuſtomed to receive, and therefore is commonly larger in Men than in Women.

It has a *Large* and *Small Extremity*, an *Upper* and *Under Surface*, a *Great* and *Small Curvature*, a *Left* and *Right Orifice*, and conſiſts of ſeveral *Layers* or *Coats*.

The *Large*, called alſo the *Left Extremity*, is ſituated in the left ſide of the Abdomen, and is conſiderably higher than the Right.

The *Upper Surface* is turned towards the Diaphragm, the *Under* towards the Inteſtines;——but when the Abdomen is laid open,—unleſs the Stomach be conſiderably diſtended,—the Superior Surface becomes anterior, and the Inferior Surface poſterior.

The *Large Curvature* is turned obliquely forwards and downwards towards the Abdominal Muſcles, and extends from one Orifice to the other.

The *Small Curvature* is oppoſed to the other, and turned backwards and upwards, towards the Spine, extending alſo between the two Orifices.

The *Orifices* are next the Small Curvature. The Left is termed *Cardia*, or *Os Ventriculi*, or *Upper Orifice* of the Stomach.—It is oppoſed to the Spine, at a little diſtance from it, and is formed by the termination of the Eſophagus.—It allows a free Paſſage for the Food into the Stomach, the return of which is prevented by the Angle formed by this part of the Stomach, and by the Fleſhy Parts of the Cardia, and of the Diaphragm in which it is ſituated.

The *Right*, or *Inferior Orifice*, is commonly termed *Pylorus* from its office as a *Porter*.

It is ſituated under the ſmall Lobe of the Liver, a little to the right ſide of the Spine,—is turned more forwards than the Cardia, and is conſiderably lower, but riſes in proportion to the diſtenſion of the Stomach.

The Stomach is connected by the Cardia to the Eſophagus,—by the Pylorus to the beginning of the Inteſtines,—by the Peritoneum and Blood-veſſels to the Spleen,—and by a reflection of the Peritoneum to the root of the Liver and to the great Inteſtines.

The *Structure* of the Stomach is in general ſimilar to that of the Eſophagus, of which it is a kind of Expanſion.

The *Coats* of the Stomach are *four* in number.

The Firſt or *External Coat*, called alſo *Peritoneal*, is a Reflection of that part of the Peritoneum which comes from the root of the Liver.

It ſtrengthens the Stomach; by its ſmoothneſs it diminiſhes the effect of Friction, and poſſeſſing few Nerves or Blood-veſſels, it is not very ſuſceptible of pain or inflammation.

The Cellular Subſtance under the Peritoneal Covering, is deſcribed by ſome Authors as a diſtinct Coat, called *Tunica Celluloſa Ruyſchiana*;—but ought not to be numbered among the Coats of the Stomach.

The Second or *Muſcular Coat* is compoſed chiefly of two Planes of Fibres variouſly diſpoſed.

The External Plane is longitudinal, extends from the longitudinal Fibres of the Eſophagus, and follows the ſame general courſe with that of the Stomach from the Great to the Small Extremity.

Upon each ſide of the Small Curvature, the longitudinal Fibres form a thick, ſtrong, Muſcular Band.

The ſecond Plane is chiefly tranſverſe or circular, and conſiderably thicker and ſtronger than the other.

Its Fibres are interſected by many ſmall, white, Tendinous-like Lines;—theſe, however, are in a great meaſure formed of that Cellular Subſtance by which the two Coats are united.

The Muſcular Coat aſſiſts in the Digeſtion of the Food, by giving a gentle motion to the Stomach, according to the direction of its Fibres, the one ſet ſhortening, the other rendering it narrower.

The Pylorus is formed by a doubling of the two inner Coats,

Coats, which project into the Paſſage between the Stomach and Inteſtine, and contain a *Ring* of Muſcular Fibres, which form a Sphincter, called *Sphincter Pylori*.

This ſubſtance, by contracting, prevents the groſſer indigeſted parts of the Aliment from eſcaping, and, by dilating, allows the Pulpy digeſted part to paſs to the Inteſtines.

The *Third Coat*, commonly called *Nervous*, but properly *Cellular*, conſiſts of a large quantity of fine Cellular Subſtance, without Fat, and is intermixed with, and ſupported by ſmall Aponeurotic-like Filaments, which croſs each other obliquely, but which are alſo of a Cellular nature.

This Coat ſtrengthens the Stomach, and allows the Veſſels to be diſtributed to the Inner Coat, with which it is intimately connected.

The *Fourth* or *Inner Coat*, called alſo *Villous*, from its reſemblance to Velvet, is continued from the Inner Coat of the Eſophagus, but is much more Villous.—It is formed of fine, ſhort, prominent Villi, which are crowded with Small Veſſels, ſome for furniſhing a Mucous Liquor to the Stomach, others for abſorbing a portion of the thinner part of the Food.

The two laſt Coats are more extenſive than the reſt, and form, upon the inner part of the Stomach, many doublings, termed *Rugæ*, the greater number of which run in a waving tranſverſe direction, and are afterwards divided into a ſort of *Net-work*. Near the Orifices, however, eſpecially towards the upper one, they run more in a longitudinal direction, and have a radiated appearance at the Cardia.

The Rugæ, like the Plicæ of the Eſophagus, are moſt diſtinct when the Stomach is empty;—when full, they are much leſs evident.

They admit of diſtenſion without endangering the Veſſels and Nerves diſperſed in them, and aſſiſt a little in detaining the Aliment till properly digeſted.

From the Inner Surface of the Stomach a Liquor iſſues, which is found to approach to the nature of Saliva, and is termed *Gaſtric Juice*.—This was formerly ſuppoſed to come from Glands ſeated in the Third Coat, but is now more frequently conſidered as a Secretion from the Arteries of the Stomach, no Glands being evident there, at leaſt in the ſound ſtate of this Viſcus.

The Arteries of the Stomach are derived from the Cœliac

liac Artery. They conſiſt of the Superior Gaſtric, which ſupplies the place next the ſmall Curvature; the Right Inferior Gaſtric, which is a branch of the Hepatic; the Pyloric Arteries, which are ſmall branches from the Gaſtrics and from the Hepatic; and of the Left Gaſtric and Arteriæ breves, which are branches of the Splenic Artery.

The *Veins* have the ſame names, and nearly the ſame courſe with the Arteries. The whole of them terminate in the Vena Portæ.

The *Abſorbents* of the Stomach are numerous and large. They paſs through ſmall Glands ſituated upon the Curvatures, and go afterwards to the Thoracic Duct.

They appear to carry Lymph only, no Chyle having been detected in them, even in caſes where the Lacteals were found full of it.

The *Nerves* are chiefly from the Eighth Pair, and partly from the Great Sympathetics, and are moſt numerous upon the Cardia.

The Stomach receives the Food from the Eſophagus, and afterwards prepares it, by digeſtion, for the Inteſtines.

The digeſtion of the Food in the Stomach is found to be effected,—by Triture, which is performed by the motions of the Stomach and ſurrounding Muſcles,—by dilution,—by a partial fermentation,—but chiefly by the action of the Gaſtric Juice ſerving as a Menſtruum.

INTESTINES.

THE *Inteſtines* conſiſt of a long Cylindrical Canal, which begins at the Inferior Orifice of the Stomach, and, after winding in various directions, terminates in the Anus.

In general they are about ſix times the length of the Body to which they belong; though, in a perſon of ſhort ſtature, the proportional length of the Inteſtines is greater, and *vice verſa*.

They occupy a large part of the Abdomen, and are connected to the Body through their whole extent, by a doubling of the Peritoneum.

On

On account of the inequalities of their ſize, they are divided into *Small* and *Large* Inteſtines, and each of theſe is ſubdivided into others.

Small Intestines.

The *Small Inteſtines* are ſmooth on their outer Surface, and of a tapering form, becoming gradually leſs in their diameter from their upper to their under extremity, and are divided into the *Duodenum*, *Jejunum*, and *Ilium*.

The *Duodenum*, ſo called from its being about twelve fingers-breadth in length, begins at the Pylorus, and makes a ſhort turn upwards and backwards, by the Neck of the Gall-bladder, to which it is contiguous, having the Anterior Layer of the Omentum fixed to its inferior part, and the Omentum Minus to its oppoſite ſide.

It then paſſes obliquely downwards and to the right ſide, before the great Veſſels which go into the Liver, and likewiſe before the Renal Artery and Vein, included in the Cellular Subſtance of the Meſocolon.

Oppoſite to the under part of the Kidney, it makes a turn to the left ſide, where it is lodged in the common root of the Meſocolon and Meſentery, and receives into its back-part the ends of the Biliary and Pancreatic Ducts, and goes over the Aorta and Vena Cava, oppoſite the laſt Vertebra of the Back.

In paſſing acroſs theſe Veſſels, it is involved in the root of the Meſentery, and aſcends a little till it gets to the left ſide of the Spine, where it perforates the common root of the Meſentery and Meſocolon, and makes a turn forwards, where it obtains the name of *Jejunum*.

The *Jejunum*, ſo named from its being commonly more empty than the other Inteſtines, in conſequence of the thinner parts of its Contents being ſooner abſorbed, begins at the laſt turn of the Duodenum, and forms numerous Convolutions, which run in all directions, and are ſituated in the upper part of the Umbilical Region.

The *Ilium*, named from its numerous Turns, begins where the Jejunum terminates, or where the Internal Plicæ become leſs conſpicuous, and is diſtinguiſhed externally from that Gut, by being ſmaller, thinner in its Coats, and paler, and from its forming about three-fifths of the length of the two Inteſtines.

The Ilium, like the Jejunum, forms many Convolutions, which are ſituated on the under part of the Umbilical

lical Region, and extend as far as the Hypogaſtric and Iliac Regions, and not unfrequently, eſpecially in Women, into the Cavity of the Pelvis.

It ſurrounds the lateral parts of the Jejunum, and is ſupported by the Oſſa Ilia ; and, the laſt turn of the Gut paſſing acroſs towards the upper edge of the Right Os Ilium, it terminates by a Valve in the left ſide of the beginning of the Colon.

Through the whole of this courſe, the Jejunum and Ilium are fixed to the Spine by a continuation of the Meſentery.

Great Intestines.

The *Great Inteſtines*, like the Small, form one continued Canal, which tapers from its upper to near its under extremity ; but differ from them in being conſiderably larger, ſhorter, and ſtraighter, and in being irregular in their Outer Surface, and tacked up into Cells, having beſides many Proceſſes depending from them, termed *Appendiculæ Pinguidenoſæ*.

Like the Small Inteſtines, alſo, they are divided into three parts, termed *Cæcum*, *Colon*, and *Rectum*.

The *Inteſtinum Cæcum*, or *Blind Gut*, forms a round ſhort Bag, only about three or four Fingers-breadth in length, and nearly the ſame in diameter. The Cæcum, properly ſo called, is that part of the Inteſtine which lies under the inſertion of the Ilium, though frequently the dilated beginning of the Colon is diſtinguiſhed by the ſame name.

It is ſituated in the Right Iliac Region, reſting on the Cavity of the correſponding Os Ilium, at the under end of the Right Kidney, and is concealed by the laſt Convolutions of the Ilium.

The bottom of it is turned downwards, and forms a ſhut Sac, the mouth of which is turned towards the Colon, and may be conſidered as forming the *Cæcum Caput Coli*.

At the poſterior and left ſide of the Cæcum, there is a *ſmall Proceſs*, about the ſame length with the Cæcum itſelf, but the diameter not larger than that of a Gooſe-quill,—termed *Appendix Vermiformis*, from its reſemblance to an Earth-worm, and *Appendix Cæci*, from its connection with the Cæcum.

It is convoluted, and fixed by its ſides to the Cæcum.

Its

It has two extremities, one of which is impervious, the other opens obliquely into the back-part of the Cæcum.

The *Colon*, ſo called from κοιλον, *cavum*, is by much the longeſt of the Large Inteſtines. It encircles the Small Guts, and is contiguous to moſt of the Abdominal Viſcera.

It is a continuation of the Cæcum, beginning at the termination of the Ilium.

It aſcends in the Right Lumbar Region, over the Kidney of that ſide to which it is connected.

From the Kidney, it paſſes forwards, and croſſes the Abdomen in the Epigaſtric and Hypochondriac Regions, connected to the Duodenum, under the name of *Great Arch of the Colon.*

The right portion of the Great Arch is ſituated under the Liver and Gall-bladder, which, after death, commonly tinges part of it and of the Duodenum with Bile.

The left portion is ſituated under the Stomach ; and immediately below the Arch, are the Convolutions of the Jejunum.

In the Left Hypochondrium, it turns backwards under the Spleen, and deſcends in the left Lumbar Region, on the fore-ſide of the Kidney, to which alſo it is cloſely connected.

In the Left Iliac Region, it forms two Convolutions, compared in ſhape to the Greek *Sigma*, and hence called *Sigmoid Flexure* of the Colon, which afterwards conſtitutes the Rectum.

The *Sigmoid Flexure* varies conſiderably in length in different perſons, extending frequently into the Hypogaſtric Region, and in ſome inſtances, as far as the Inteſtinum Cæcum.

The Colon, through its whole extent, is fixed to the Body by means of the Meſocolon.

The *Rectum* begins at the laſt Lumbar Vertebra, and has its name from appearing ſtraight when viewed anteriorly.

It deſcends upon the fore-ſide of the Os Sacrum and Os Coccygis, and terminates in the Anus, a little beyond the extremity of the laſt named Bone.

In its courſe, it follows the direction of the Bones over which it paſſes, turning firſt downwards, then a little backwards, then forwards, and is fixed to them by the Meſorectum.

The

The Rectum differs from the other Inteſtines, in becoming wider in its progreſs downwards, and forming below a Reſervoir for the Fæces.

At the Anus, it contracts into a narrow Orifice, the ſides of which are diſpoſed in cloſe longitudinal folds.

Upon the Outer Surface of the Great Inteſtines, but more eſpecially upon the Colon, are the *Appendiculæ Pinguedinoſæ*, ſituated at different diſtances from each other,—thin at their roots, becoming thicker in their bodies, and projecting from the Inteſtines like ſo many pendulous Papillæ.

They are covered by the Peritoneum, and are of the ſame ſtructure and uſe with the Omentum.

Beſides the Appendiculæ, there are on both ſides of the adheſions of the Meſocolon, *Adipoſe Strata*, which are of the ſame nature with the others.

The Colon is divided, longitudinally, into three parts, by as many *Ligamentous-like Bands*, which run upon its Surface.

One of them goes along each ſide of the Colon; and that moſt expoſed to view when the Omentum is ſeparated, is the largeſt: The third, which is the ſmalleſt, and which was diſcovered by MORGAGNI, is concealed by the attachment of the Meſo-colon.

They begin at the root of the Appendix Vermiformis, and, after running along the Cæcum and Colon, unite into two, and then terminate on the Rectum.

MESENTERY.

THE *Meſentery* is formed by a doubling of the Peritoneum, which is detached forwards, and includes the Inteſtines as in a Sling.

It is named from its ſituation in the middle of the Inteſtines, and is divided into two parts, one connecting the Small Inteſtines, and retaining the name of *Meſentery*; the other, the Great Inteſtines, and termed *Meſocolon.*

The Meſentery begins at the laſt turn of the Duodenum, and runs obliquely downwards and towards the right ſide, along the Vertebræ of the Loins, to the firſt, ſecond, and third of which it is chiefly connected.

Between the two Layers of the Meſentery, are incloſed a conſiderable quantity of Cellular Subſtance and Fat,

Fat, the numerous Blood-veſſels and Nerves, with the Lacteals and Glands of the Jejunum and Ilium.

Its anterior edge is much more extenſive than the poſterior, being plaited and folded,—the Plaits correſponding with the Convolutions of the Inteſtines to which it is fixed.

The *Meſo-colon* is the continuation of the Meſentery, which, after reaching the lower extremity of the Ilium, contracts, and obtains this name.

It follows the courſe of the Great Inteſtines, and fixes them in their place.

Under the Right Kidney, it is narrow and firm, and forms the Right Ligament of the Colon.

Oppoſite to that Kidney, it appears to be loſt by the immediate adheſion of the Colon to the Kidney and Duodenum.

It then turns acroſs, and forms a broad expanſion, which incloſes the Arch of the Colon at its anterior edge; and behind, it ſeparates and incloſes the anterior part of the Duodenum, and is fixed to the Spine.

It adheres a little to the under part of the left extremity of the Stomach, and afterwards deſcends over the left Kidney, at the under end of which it forms the left Ligament of the Colon.

It afterwards expands, adheres to the large Pſoas Muſcle, and forms a looſe fold, which retains the Sigmoid Flexure of the Colon.

At the laſt Vertebra of the Loins, it forms the *Meſo-rectum*, which by degrees becomes narrower, and diſappears towards the under part of the Pelvis, the Rectum being then immediately connected to the Os Sacrum.

Between the Layers of the Meſocolon are placed the Arteries, Veins, and Nerves, with the Abſorbents and Glands of the Colon.

The *uſe* of the Meſentery, in general, is to ſuſpend, connect, and retain the Inteſtines in their places,—to furniſh them with an external Coat,—to receive their Glands, Veſſels, and Nerves, and to allow the two laſt to be properly diſtributed.

OMEN-

Omentum.

The *Omentum* or *Cawl*, formerly called *Epiploon*, from its ſeeming to float upon the Inteſtines, is a fine Membranous Bag, intermixed with much Fat, and covering a large portion of the Anterior Surface of the Abdominal Viſcera.

It is divided into *Omentum Gaſtro-colicum*, and *Omentum Colicum*, the former common to the Stomach and Colon, the latter proper to the Colon: They are, however, a continuation of one and the ſame ſubſtance.

The *Omentum Gaſtro-colicum* conſiſts of an anterior and poſterior part, each of which is formed of two Membranes intimately united.

In young ſubjects, the Omentum forms a diſtinct Bag, but in old people, the layers of which it is compoſed become more or leſs incorporated, and Cribriform or Reticular.

The Anterior Layer is a continuation of the Peritoneal Coats, produced from the upper and under Surfaces of the Stomach.

This Production ariſes from the whole length of the large Arch of the Stomach, and beginning of the Duodenum;—its origin extending as far as the Spleen, and deſcending to a little below the Umbilicus, eſpecially in fat people,—but without adhering to the Abdominal Muſcles behind which it is ſituated.

Its under edge is reflected, to form the Poſterior Layer, which aſcends without adhering to the Small Inteſtines over which it is ſpread, till it reaches the Arch of the Colon, to the greater part of which Arch, and to the Veſſels of the Spleen, it is connected.

The *Omentum Colicum* ariſes from the right part of the Arch of the Colon, in the manner the other part of the Omentum ariſes from the Stomach, and ſends downwards and to the right ſide a Cuneiform Proceſs, to be connected to the Cæcum.

Beſides the Omentum, there is a Membrane much ſmaller than the former, ſituated between the Liver and Stomach, termed *Omentum Hepato-gaſtricum*, or *Omentum minus* of Winslow, or *Membrana Macilentior* of Haller from its having little Fat in it.

It paſſes from the fore-part of the Sinus of the Porta,

to the under and back-part of the Liver, to be connected to the whole edge of the ſmall Curvature of the Stomach, and to the beginning of the Duodenum.

Like the other Omentum, it is compoſed of two Layers, but is thinner, leſs Fat, and more uniform in its ſtructure, and alſo differs from it in having no reflection upwards.

After the Omentum Minus reaches the Stomach, its two Layers ſeparate from each other, incloſe that Viſcus, and form its External Coat.

At the great Curvature of the Stomach, they rejoin, and form the Anterior, then the reflected or poſterior part of the Omentum Majus.

The poſterior part ſeparates again into two Layers, which incloſe the Colon, and form its External Coat.

At the oppoſite ſide of the Colon, the Layers re-unite, and form the Meſo-colon.

By the Membrane thus continued, a large irregular Bag is formed, of which the Omentum Minus, Stomach, and anterior portion of the Omentum Majus, conſtitute the anterior, and the reflection of the Large Omentum, the Colon, and Meſo-colon, the poſterior part.

At the upper and right ſide of the Sac, there is a Paſſage large enough to admit a Finger, termed *Foramen* WINSLOWI.

It is ſituated immediately behind the Cord of the great Veſſels which lead to the Liver, and is of a Semicircular form.

It is compoſed of the Peritoneum, under the appearance of two Ligaments which connect the ſurrounding parts to each other.

The Foramen of WINSLOW maintains a communication between the Large Sac of the Omentum and common Cavity of the Abdomen, from which circumſtance, Fluids generated by diſeaſe may readily paſs from one of theſe Cavities to the other.

The Omentum, by its Fatty nature, ſerves to lubricate the Viſcera, and prevent them from being injured by friction.

Structure of the Small Intestines in General.

The *Structure* of the Small Inteſtines is nearly ſimilar to that of the Stomach, and the number of their *Coats* the ſame.

The *External Coat*, excepting in a portion of the Duodenum, is a continuation of that part of the Peritoneum which forms the Meſentery. It cloſely ſurrounds the Inteſtines, adhering to them by fine Cellular Subſtance.

The *Second*, or *Muſcular Coat*, as in the Stomach, is compoſed of two Planes of Fibres, the External or Longitudinal of which are more minute than the Internal.

The *Circular Fibres* are diſtinct and numerous: They conſiſt of Segments of Circles, which unite at different diſtances, ſo as to ſurround the Canal.

The *Longitudinal Fibres* ſhorten, and the *Circular* contract the Inteſtines; and upon the alternate relaxation and contraction of theſe Fibres, depends that Vermicular motion, called *Periſtaltic*, by which the Contents are puſhed through the Canal.

The *Third*, commonly called *Nervous Coat*, like that in the Stomach, is white and firm, and compoſed of Cellular Subſtance, without Fat;—its firmneſs giving ſtrength to the Inteſtines.

The *Fourth*, or *Villous Coat*, differs from that of the Stomach, in forming, with the Cellular Coat, numerous tranſverſe Folds, termed *Valvulæ Conniventes*, from their ſerving, as a kind of Valves, to retard the motion of the Food.

One edge of theſe Valves is fixed to the Inteſtine, the other is looſe.—They are much deeper than the Rugæ of the Stomach, and placed oppoſite to the Interſtices of each other, and are of different lengths, not forming entire Circles.

The *Villi* of the Inner Coat are much more conſpicuous than in the Stomach, being compoſed not only of the extremities of Arteries, Veins, and Nerves, but particularly of the Mouths of Lacteal Veſſels, the Origins of which are extremely ſmall, and have a fungous appearance.

Numerous *Ducts* of *Simple* and *Compound Glands* terminate on this Coat, for the ſecretion of Mucus.

The former are called *Solitary*, and the latter *Congregate*;

gatæ;—and, from their deſcribers, *Glandulæ* PEYERI, and *Glandulæ* BRUNNERI.

They are in the form of Papillæ, but ſo minute as ſeldom to be ſeen, excepting in the diſeaſed ſtate,—though they are ſuppoſed to be diſperſed over the whole of the Canal.

STRUCTURE OF THE SMALL INTESTINES IN PARTICULAR.

The *Duodenum* is the laxeſt and ſtraighteſt of the Small Inteſtines, and ſo large as to have been conſidered as a *Ventriculus Succenturiatus*, or *Secondary Stomach*.

It is of a redder colour than the reſt, has a thicker Muſcular Coat, receives only a partial covering from the Peritoneum, and is fixed more cloſely to the Body, without floating like the other Inteſtines.

It is perforated at the diſtance of three or four fingers-breadth from the Pylorus, by the ends of the Biliary and Pancreatic Ducts, for the reception of Bile and Pancreatic Juice.

In the Duodenum, the Lacteal Veſſels begin to make their appearance, and numerous Mucous Glands are found in it, eſpecially near the Pylorus.

The *uſe* of the Duodenum is, to receive the Food from the Stomach, and detain it till mixed with the Bile and Pancreatic Duct.

The *Jejunum* differs from the Duodenum in deriving its common Coat wholly from the Peritoneum,—in being ſmaller,—in having a weaker Muſcular Coat, the external Fibres of which are extremely minute,—in the Valvulæ Conniventes being larger and more numerous,—and in the Villi and Lacteals which proceed from them being much more conſpicuous.

The *Ilium* differs from the former in being leſs in diameter, and its Coats thinner and of a paler colour, and in having fewer and ſmaller Lacteal Veſſels.—In this Inteſtine the Valvulæ Conniventes gradually decreaſe in ſize and number, and at length entirely diſappear.—At its under end, the Mucous Glands are diſtinct and numerous.

The *uſe* of the Small Inteſtines in general is,—to promote the formation of the Chyle,—to allow it to be ab-

 ſorbed,

forbed, and—to propel the remains of the Food into the Large Inteftines.

Structure of the Great Intestines in General.

The Great have the fame number of Coats with the Small Inteftines, but differ from them in being thicker and ftronger.—The Valvulæ Conniventes are deep, and placed oppofite to each other, and, as in the Small Inteftines, diminifh in number and in fize towards the under extremity.—The Villous appearance is much lefs diftinct.—The Mucous Glands are larger, but fimpler than thofe of the Small Inteftines.

Structure of the Great Intestines in Particular.

The *Inteftinum Cæcum* is of the fame general ftructure with the reft of the Great Inteftines. Its Villi are very fhort; and it has a number of folitary Mucous Glands, broader than thofe of the Small Inteftines, which, when difeafed, fometimes appear like fmall-pox, with a perforation in each.

The *Appendix Vermiformis* is of the fame ftructure with the other Inteftines, contains no Fæces, but is furnifhed with numerous Glands fimilar to thofe of the Duodenum, the contents of which pafs into the Cæcum, a little below the Valve of the Colon, and affift in lubricating that Inteftine, and in facilitating the expulfion of the Fæculent Matter.

In the Cæcum, and beginning of the Colon, the Food coming from the Ilium is retained for fome time, and, in confequence of abforption, acquires a greater degree of confiftency, and receives a fœtid fmell.

The *Valvula Coli*, fometimes called *Valvula-Ilei*, or *Valvula* Bauhini, from its fuppofed difcoverer, and *Valvula* Tulpii, from the Author who gives a particular defcription of it, is fituated at the beginning of the Colon, and is placed tranfverfely in the pofterior and left part of that Inteftine.

It is formed of a projection of the Villous and Nervous Coats, and Circular Mufcular Fibres of the Ilium, Cæcum,

Cæcum, and Colon, and has two Folds or Lips, with an aperture in form of a Mouth or Chink between them.

At the ends of the Valves are two cords, termed *Retinacula*, or *Fræna* MORGAGNII, which retain the Valve in its proper ſituation.

The Valve of the Colon allows a free paſſage for the Contents of the Small into the Large Inteſtines, but completely prevents their return.

The *Colon* is of a ſimilar ſtructure with the Cæcum.—The Longitudinal Muſcular Fibres are collected upon it into three Faſciculi or Bands, which ariſe at the root of the Vermiform Proceſs, and are continued along the Colon to the Rectum.

The Longitudinal Bands are ſhorter than the inner parts of the Colon, and of conſequence aſſiſt in contracting it, and forming it into Plicæ, which lie acroſs the Gut, anſwering to the Valvulæ Conniventes; only they are at a greater diſtance from each other, and much larger, dividing the Colon into little apartments, called *Cells*.

The *Cells of the Colon*, with their Partitions, have a threefold order, the Inteſtine being almoſt quite ſmooth or plain, oppoſite to the Longitudinal Bands.

The Cells aſſiſt in preventing the too quick deſcent of the Fæces.

The *uſe* of the Colon is,—to receive the Excrementitious parts of the Aliment,—to retain them,—to change them into Fæces, and then, by the periſtaltic motion of the Inteſtines and power of Reſpiration, to puſh them, by ſlow degrees, to the Rectum.

The *Rectum* differs from the Colon in being covered only anteriorly and laterally by the Peritoneum:—Its Muſcular Fibres are ſtronger and thicker, and ſpread uniformly over the Inteſtine.—The Circular Fibres are ſo thick at the end of the Rectum, as to have been named *Internal Sphincter*.

It has no Cells like the Colon; but the Cellular and Inner Coat are ſo much larger here than they are higher up, as to fall into tranſverſe folds, which, however, diſappear in proportion to the diſtenſion of the Inteſtine.

The middle and under end of the Rectum has numerous large Mucous Glands or Follicles.

The extremity of the Rectum forms a firm Circle, which acts as a Valve, and aſſiſts the proper Sphincter in preventing the involuntary diſcharge of the Fæces.

The Verge of the Anus is ſurrounded with deep Follicles,

licles, the contents of which prevent the tender Skin of the Anus from being excoriated by hard or acrid Fæces.

The Anus is alſo ſurrounded with a great deal of Fat, which admits of the dilatation of the Rectum, and facilitates the diſcharge of the Fæces.

The Rectum receives the Fæces from the Colon, retains them for a certain time, till, by their weight and acrid nature, it is ſtimulated to diſcharge them; which it does by the power of its Muſcular Coat, and of the Levator Ani, aſſiſted by the action of the Diaphragmatic and Abdominal Muſcles.

The *Blood-veſſels* of the Inteſtines are large and numerous, and are derived from different ſources.

The Duodenum receives Branches from the Splenic and Hepatic Arteries.

The Jejunum, Ilium, and right half of the Colon, are ſupplied by the Superior Meſenteric Artery; and the left half of the Colon with the Rectum, by the Inferior Meſenteric Artery.

The *Veins* of all the Inteſtines ſend their Blood to the Vena Portæ.

The *Abſorbents* of the Inteſtines are large and numerous.—They ariſe from the inner Surface of the Inteſtines, run in the Meſentery and Meſo-colon, paſſing through their numerous Glands.—The Abſorbents of the Small Inteſtines terminate in the receptacle of the Chyle; thoſe of the Large Inteſtines, which are ſmaller than the former, go partly to the Thoracic Duct, and partly to the Lymphatics of the Loins.

The *Nerves* of the Inteſtines are ſmall, but numerous, and are derived partly from the Eighth Pair, but chiefly from the Great Sympathetics.

The Veſſels and Nerves of the Omenta are Branches of thoſe which ſupply the Stomach, and have the name of *Gaſtro-Epiploic.*

LIVER.

The *Liver* is a large ſolid Maſs, of a duſky red colour, ſituated immediately under the Diaphragm, extending downwards to the margin of the Thorax, but not going beyond it.

It is placed partly in the Right Hypochondrium, which it in a great meaſure fills, and partly in the Epigaſtrium, reaching over a little way into the Left Hypochondrium.

It is *convex* and very *ſmooth* on the upper Surface, where it is oppoſed to the Diaphragm, though a little flattened on the upper part of its left ſide, where it is placed oppoſite to the Heart.

It is *irregularly concave* on the under ſide, where it reſts upon the Stomach and Inteſtines, and is perforated by ſeveral large Blood-veſſels.

It is *thick* on its right and poſterior part, and becomes gradually *thinner* towards the left ſide; is *obtuſe* or *blunt* on its poſterior, and *acute* or *ſharp* on its anterior edge, —and conſiderably *broader* from one ſide to the other, than from before backwards.

It is divided into *Prominences* or *Lobes*, two of which, called *Great* and *Small*, or *Right* and *Left Lobes*, are ſo conſiderable as to form the Body and whole upper part of the Liver:—The others are ſmall, and are placed upon the under ſide of the former.

The *Great Lobe* is placed obliquely in the Right Hypochondriac Region, following the Curve of the Diaphragm, and reſts upon the Pylorus, Colon, and top of the Right Kidney.

The *Small Lobe*, diſtinguiſhed from the Great one by a broad Ligament, is placed almoſt horizontally, chiefly in the ~~Hypo~~gaſtric, and reaching only a little way into the Hypochondriac Region.

—The other Lobes are,—

The *Lobulus Spigelii*, which is ſmall when compared with the two former Lobes, but is the principal one below.

It is ſituated near the Spine, upon the left ſide of the Great Lobe, and is of a Pyramidal form, projecting like a Nipple, at the ſmall Curvature of the Stomach.

The

The *Lobulus Caudatus*, which is merely the root, or one of the angles of the Lobulus Spigelii, advancing towards the middle of the lower side of the Great Lobe.

The *Lobulus Anonymus*, or *Quadratus*, which is placed between the passage of the round Ligament and the Gall-bladder, and is less prominent, but broader than the former Lobule.

From the Lobulus Anonymus, a bridge called *Pons*, or *Isthmus Hepatis*, runs across the Passage for the Round Ligament, to be joined to the Left Lobe:—It is sometimes awanting.

Upon the under side of the Liver, there are several *Fissures*, of which the following are the principal.

The *Great Fissure*, called *Fossa Umbilicalis*, between the Right and Left Lobes, at the under and fore-part of the Liver.

This is terminated by a *Notch* at the fore-part of the Liver,—of different depths in different bodies,—and behind, it is commonly covered with the Bridge above mentioned.

The *Principal Fissure*, termed *Sulcus Transversus*, or *Sinus Portarum*, extending from right to left, between the Great and Small Lobes, and bounded by these Lobes at its extremities, and by the Lobulus Anonymus before, and the Lobulus Spigelii behind, the two latter forming parts compared by the Ancients to a Gate, and therefore called *Porta*.

The *Depression* between the Great Lobe and Lobulus Spigelii, for the passage of the Inferior Vena Cava, which has frequently a bridge over it, forming it into a Canal.

A *Small Depression*, called *Fossa Ductus Venosi*, between the Left Lobe and Lobulus Spigelii, running a little obliquely from right to left side, and receiving a Ligament,—which is a Branch of the Umbilical Vein in the Fœtus.

The Liver is connected to the Body by different *Processes*, termed its *Ligaments*, all of which, excepting one, are formed by doublings of the Peritoneum, viz.

The *Ligamentum Latum*, or *Suspensorium Hepatis*, placed between the Right and Left Lobes above, and extending below into the Fossa Umbilicalis.

It is fixed obliquely to the Diaphragm and tip of the Ensiform Cartilage, and then descends in the same oblique direction, adhering to the inner part of the Vagina of the Right Rectus Abdominis Muscle, as far as the Umbilicus.

The

The *Ligamentum Rotundum*,—which is the Umbilical Vein in the Fœtus, placed in a doubling at the under part of the Ligamentum Latum, and fixed to the Umbilicus.

These two Ligaments have been supposed to resemble a *Falx*, with the edge turned uppermost, from which circumstance the Ligamentum Latum is sometimes also called *Falciforme*.

The *Ligamentum Dextrum*, or *Right Lateral Ligament*, which is short, and connects the back-part of the right extremity of the Great Lobe to the Diaphragm.

The *Ligamentum Sinistrum*, or *Left Lateral Ligament*, which is longer than the former, and connects the left extremity of the Small Lobe to the Diaphragm.

The *Ligamentum Coronarium*, considered by some as merely Cellular Substance, and by others as a reflection of the Peritoneum, or both.—It unites the root of the Liver to the Tendinous Portion of the Diaphragm.

Besides the Ligaments already mentioned, two others are described by HALLER; one called *Hepatico-colicum*, which passes from the Gall-bladder and contiguous Sinus Portarum, across the Duodenum, to the Colon;—another called *Hepatico-renale*, which descends from the root of the Liver to the Kidney.—These, as well as the other Ligaments of the Liver in general, are productions of the Peritoneum.

The Ligaments of the Liver preserve it in its proper situation, and of course prevent it from inclining too much in any direction.—The Stomach and Intestines support it when the Body is upright, and the Diaphragm, when the Body is inverted.

The Liver has a simple Coat adhering closely to it, which it derives from the Peritoneum, and is every where covered by this Membrane, excepting behind, where it adheres to the Diaphragm by Cellular Substance.

The Substance of the Liver is composed of several kinds of Vessels, the extreme Branches of which are intermixed in such a manner, as to form numberless Pulpy Corpuscles, named *Acini*, from a resemblance to small Stones or Kernels of Fruit, which, when minutely examined, are observed to be composed of Vessels in the form of radiated *Villi* or *Penicilli*.

The *Vessels* of the Liver are, the *Hepatic Artery*, *Vena Portarum*, *Venæ Hepaticæ*, *Absorbents*, and *Biliary Ducts*.—It has likewise numerous *Nerves*.

The Trunks of the Hepatic Artery, Vena Portæ, Biliary

liary Ducts, and Nerves, with the Absorbents and Lymphatic Glands of the Liver, form a large *Cord* at its under part.

The Artery is situated in the left part of the Cord, the Vein in the right, with the Trunk of the Biliary Ducts before it;—the Nerves and Lymphatics surrounding the great Vessels.

The Cord of Vessels and Nerves is intermixed with much Cellular Substance, and covered externally by a reflection of the Peritoneum, which has obtained the name of *Capsule of* GLISSON.

The Branches of Vessels and Nerves accompany each other through the substance of the Liver, forming small Fasciculi, in a manner somewhat similar to that by which the Cord is formed by their Trunks.

In their course through the Liver, the Branches of the different Vessels and Nerves, but particularly those of the Vena Portæ, are inclosed in a large portion of Cellular Substance, which is also frequently called *Capsule of* GLISSON, from that Author supposing it to be a continuation of the Capsule which covers the Vessels before they enter the Liver.

The *Hepatic Artery* is derived from the Cœliac, and is dispersed throughout the whole substance of the Liver, and also upon the Coat which covers it, and is so small, when compared with the bulk of the Liver, as to have been generally supposed to be destined for the nourishment merely of that Viscus; but from injections passing from the Artery to the Biliary Ducts, and from other causes, it has been supposed by some Anatomists, that the Hepatic Artery is not only intended to nourish the Liver, but is capable of secreting part of the Bile;—and this supposition is farther confirmed, from the Vena Portæ having, in a recent case, been found awanting, while, at the same time, the Hepatic Artery was larger than usual, and the Veins, which commonly form the Vena Portæ, terminated in the Vena Cava.

The *Vena Portæ* is named from its situation with respect to the Porta of the Liver.

It partakes of the nature of an Artery and a Vein:—Like the former, it carries the Blood from the Trunk to the Branches, and, like the latter, it carries it to the Heart;—or it is peculiar in the Blood, in one part flowing from the Branches to the Trunk, and in another from the Trunk to the Branches.

It

It is formed by the Veins of the Stomach and Inteſtines, joined to thoſe of the Spleen, Omentum, and Pancreas, and approaches to the nature of an Artery in the thickneſs of its Coats, though it has no pulſation.

It paſſes to the Porta, where, from its great ſize, it is named *Sinus* of the Vena Portæ, and divides into Branches which accompany thoſe of the Artery in their courſe through the ſubſtance of the Liver, terminating at laſt in the Pulpy Corpuſcles.

The *Vena Portæ* ſerves to carry Venous Blood to the Liver, for the ſecretion of the Bile.

The *Venæ Hepaticæ* are numerous. They are reflected partly from the extremities of the Artery, and partly from thoſe of the Vena Portæ. They unite by degrees, and accompany the other two ſets of Veſſels; but at the root of the Liver they form two or three large Trunks which terminate in the Vena Cava, where it is about to perforate the Diaphragm.—They likewiſe ſend off ſome ſmall Branches which terminate in the Cava, where that Vein lies behind the Liver.

The Venæ Hepaticæ receive the Blood from the Hepatic Artery and Vena Portæ, after the Bile has been ſecreted, and return it to the Vena Cava, to be conveyed by it to the Heart.

The *Lymphatics* of the Liver are ſo numerous as to cover almoſt the whole of its outer Surface. They diſcharge their contents, partly into the beginning of the Thoracic Duct, and partly to a Plexus ſituated in the fore-part of the Thorax.

The *Nerves* of the Liver are alſo numerous. They ariſe from the Great Sympathetics and Eighth Pair, and accompany the Blood-veſſels.

The *Biliary Ducts* ariſe by extremely minute Branches, termed *Pori Bilarii*, or *Tubuli Biliferi*, chiefly from the extremities of the Vena Portæ, in the Subſtance of the Corpuſcles, through the whole of the Liver.

The Pori Bilarii run in company with the Branches of the Artery and Veins, and unite into larger and larger Branches, which afterwards go into two, and theſe again into a ſingle Trunk in the Sinus Portarum, called *Ductus Hepaticus*.

The *Ductus Hepaticus* ſerves to carry the Gall or Bile, which is of a yellow green colour, from the Liver,—and to convey it by the power of the Heart, Hepatic Artery, and Vena Portæ, aſſiſted by the preſſure of the ſurrounding

ing Muſcles, to the Duodenum, and partly to the Veſicula Fellis.

The *Veſicula*, or *Cyſtis Fellis*, or *Gall-bladder*, is a ſmall, oblong, Pyriform Bag, conſiſting of a Bottom, Body, and Neck, ſituated upon the concave ſide of the Great Lobe of the Liver, and placed in a tranſverſe direction from behind forwards.

It extends from the Sinus Portarum, where the Neck is ſituated, to the anterior edge of the Liver, and, when full, advances beyond the edge of the Liver, ſo as ſometimes to have its Fundus oppoſed to the ſoft parts of the Abdomen, under the edge of the Falſe Ribs.

The bottom is a little lower than the Neck, when the Body is in the erect poſture. It inclines alſo a little to the right ſide, and reſts upon the Colon at the beginning of the Duodenum.

It is compoſed of ſeveral *Coats*, the *external* of which is a continuation of the Membrane of the Liver: This, however, is only a partial Coat covering that part of the Gall-bladder which projects beyond the Surface of the Liver.—It ſerves to give ſtrength to the Gall-bladder, and to fix it to the Liver.

Under the former Coat, a few pale ſcattered Fibres, running in various directions, are ſometimes obſerved, which have been conſidered as a *Muſcular Coat;* and under this is a ſmall quantity of Cellular Subſtance, which has obtained the name of *Nervous Coat.*

The *Inner Coat*, ſometimes called *Villous*, is full of ſmall Reticular Rugæ or Folds, which become extremely minute towards the Cervix, where they run in a longitudinal direction.

The Surface of this Coat is every where perforated by the Ducts of ſmall Follicles, which diſcharge a viſcid Mucus, to defend the Surface of the Inner Coat from the Stimulant nature of the Bile.

The Gall-bladder is connected through its whole length to the Liver by Cellular Subſtance, Blood-veſſels, and Abſorbents, among which the *Hepato-cyſtic Ducts*, ſimilar to thoſe found in many Animals, were in former times deſcribed, and ſuppoſed to carry the Bile found in the Gall-bladder immediately from the Liver. It is now ſufficiently aſcertained,—that no ſuch Ducts exiſt in the Human Body.

The Gall-bladder has Blood-veſſels, Abſorbents, and Nerves,

Nerves, in common with those of the Liver.—Its Veins paſs into the Vena Portæ.

The Neck of the Gall-bladder is twiſted and folded againſt itſelf, and afterwards contracts and ſends out a Duct called *Cyſticus*, which runs near the *Ductus Hepaticus*, and then joins it, to form the *Ductus Communis Choledochus*.

The *Ductus Cyſticus* is ſmaller than the *Ductus Hepaticus*, and differs from it alſo in having a number of imperfect Partitions or *Plicæ*, running in a ſomewhat ſpiral direction, and forming it into Cells which retard the flow of the Bile.

The Gall-bladder ſerves as a receptacle for the Bile, when the Stomach and Inteſtines are empty and have no need of it, and retains it till wanted for the purpoſe of digeſtion.—It is afterwards diſcharged from the Gall-bladder, when the Stomach is full, into the Ductus Communis, and from that to the Duodenum, chiefly by the preſſure of the ſurrounding Viſcera, and partly, as ſome Anatomiſts ſuppoſe, by a contractile power in the Gall-bladder itſelf.

The whole of the Bile contained in the Gall-bladder is found, by experiment, to paſs from the Liver through the Hepatic Duct to the Ductus Communis, and from that by the Cyſtic Duct into the Gall-bladder.

The Bile returning from the Gall-bladder is obſerved, from the thinner parts being abſorbed, to be thicker, more acrid and bitter, and of a deeper colour, than that which flows from the Liver.

The *Ductus Communis Choledochus*, called *Choledochus* from its conveying Bile, is about the ſize of a Gooſe-quill, and is conſiderably larger than either of the Ducts which open into it.

It deſcends at the poſterior and left part of the Duodenum, and paſſes for ſome way obliquely between the Muſcular and Inner Coats of that Gut,—the obliquity anſwering the purpoſe of a Valve.

It terminates in the left, poſterior, and near to the under part of the ſecond Turn of the Inteſtine, by a projecting Orifice, which is rounded above, and pointed below.

The Structure of the Ductus Choledochus, and of the Biliary Ducts in general, is of the ſame nature, being entirely Membranous: The Inner Surface of the Ducts alſo agree in being perforated by numberleſs pores, which are

are the Mouths of Mucous Follicles, ſimilar to thoſe upon the inſide of the Gall-bladder.

The Bile ſerves to mix the different parts of the Food properly together, for the formation of the Chyle,—to correct too great a diſpoſition to acidity,—and to excite the Periſtaltic motion of the Inteſtines.

SPLEEN.

The *Spleen* is a ſoft and very Vaſcular Subſtance, and of a purple colour.

It is ſomewhat depreſſed, is of a long oval form, and of a conſiderable ſize, but varying in this reſpect in different ſubjects.

It is ſituated in the Left Hypochondriac Region, between the large extremity of the Stomach and correſponding Falſe Ribs;—its under end lying behind the Colon, and over the top of the Left Kidney.

The ſituation of the Spleen varies a little, according to the ſtate of Reſpiration, and to the fullneſs or emptineſs of the Stomach;—riſing or falling as the Lungs are leſs or more dilated, and becoming more oblique in its ſituation,—with its inferior extremity turned more forwards,—in proportion as the Stomach becomes more diſtended.

Its *External Surface* is convex and uniform, like that of the Ribs, &c. to which it is oppoſed.

Its *Internal Surface*, or that next the Spine, is irregularly concave; and is divided into an Anterior and Poſterior Plane, by a longitudinal Groove or Fiſſure, where the Veſſels and Nerves enter.

The Anterior Plane is more concave than the Poſterior, correſponding to the contiguous convexity of the Stomach.

The Spleen has frequently deep *Fiſſures* upon its edges;—ſometimes it has ſmall *Appendages* attached to it, and not unfrequently there is one or more *Small Spleens* connected with it.

At the under ſide, it is fixed to the Omentum, and, by means of that and Blood-veſſels, to the Stomach and Pancreas.—Behind, it is connected to the Diaphragm; and below, to the Left Kidney and Colon, by reflections of the Peritoneum, and by Cellular Subſtance.

It is covered by a *double Membrane*, one Layer of which

which is a production of the Peritoneum, the other proper to the Spleen itſelf; but ſo cloſely connected to the common Coat, that they appear to be one and the ſame Membrane.

The ſubſtance of the Spleen is remarkably ſoft, and is by much the moſt tender of the Abdominal Viſcera.

It conſiſts of a Congeries of Blood-veſſels, Lymphatics, and Nerves, joined together and ſupported by a large quantity of Cellular Subſtance.

The extreme Branches of the Blood-veſſels put on the appearance of *Penicilli*, or ſmall *Bruſhes*, which have been miſtaken for Glands.

Theſe Veſſels are ſo tender, that when an injection is forcibly thrown into either Artery or Vein, it burſts into the common Cellular Subſtance, and gives the appearance of Follicles or Cells.

The *Blood-veſſels* of the Spleen are among the largeſt of the Body, in proportion to the Viſcus on which they are diſperſed.

The *Artery* is a principal Branch of the Cæliac.—It runs in a ſerpentine direction, and, after ſending Branches to the Pancreas, &c. and the *Arteriæ Breves* to the left end of the Stomach, it goes into the ſubſtance of the Spleen, where it is ſubdivided into Branches, which are crowded together, and run in every direction, forming at length Plexus and Penicilli, which terminate in the Branches of the correſponding Vein.

The Vein, like that in moſt other Viſcera, is larger than the Artery :—It receives the Blood immediately from the terminations of the Artery, without the intervention of Cells.

The Splenic Vein receives the *Venæ Breves* of the Stomach, the Pancreatic Veins, &c. and forms one of the principal Branches of the Vena Portæ.

The *Lymphatics* from the ſuperficial parts of the Spleen join the deep-ſeated Abſorbents at the Fiſſure where the Blood-veſſels enter, and afterwards paſs through ſeveral Conglobate Glands lying over the Splenic Artery.

They intermix with Lymphatics belonging to ſeveral other Viſcera, and terminate in the Thoracic Duct.

The *Nerves* of the Spleen, which are ſmall, but conſiderable in number, are Branches of the Great Sympathetic and Eighth Pair, and form an irregular Plexus which ſurrounds the Veſſels.

No Excretory Duct has been found to proceed from the

the Spleen, in consequence of which very various opinions have been entertained with respect to the use of that Organ.

Many of the ancients were of opinion,—that besides the Bile of the Liver, there was an *Atra Bilis*, or *Black Bile*, and that the Spleen was the receptacle of the latter.

Others have thought a particular *Menstruum* was secreted in it, and conveyed to the Stomach for the purpose of digestion.

Others again,—that the Blood of the Spleen promotes the sluggish circulation of the Blood of the Vena Portæ.

The late Mr Hewson, who has written particularly on the Spleen, was of opinion it concurred with the Thymus and Lymphatic Glands, in forming the red Globules of the Blood, and that these Globules were rendered complete in the Spleen.

It has been also supposed,—that as the Stomach becomes full, the Spleen is compressed by it, in consequence of which a greater quantity of Blood is sent to the Pancreas, for the Secretion of the Pancreatic Juice.

But the present most prevalent opinion is,—that the Blood undergoes some change in it, which renders it useful in the secretion of the Bile ;—and the opinion is supported from the great quantity of Blood with which this Organ is known to be supplied, and from its Vein, not only in Man, but in other animals, passing to the Vena Portæ.

PANCREAS.

The *Pancreas*, i. e. *All Flesh*, or the *Sweet Bread*, is a long flat Gland of the Conglomerate kind, and of the same nature with the Salivary Glands, of which it may be reckoned the largest.

It is situated in the Epigastric Region, and is placed transversely in the back-part of the Abdomen, between the Stomach and Spine.

It has a large or Right Extremity, and a small or Left one, an Anterior and Posterior Surface, and an Upper and Under Edge.

The Right Extremity is attached to the left side of the second Turn of the Duodenum, or to that part where the Intestine is about to go across the Spine.

From the under part of the Right Extremity, the

Pancreas

Pancreas ſends down an Elongation or Proceſs, which adheres cloſely to the Duodenum.

This Proceſs was diſcovered by Winslow, and termed by him *Pancreas Minus.*—It is alſo called *Head of the Pancreas.*

The Body of the Pancreas paſſes before the upper part of the tranſverſe portion of the Duodenum, and over the Aorta, Vena Cava, and part of the Splenic Veſſels, to all of which it is attached.

The ſmall extremity, which is rounded, is fixed to the Spleen, through the medium of the large Omentum.

The Pancreas is covered anteriorly by the two Layers of the root of the Meſo-colon;—poſteriorly, it is only covered with Cellular Subſtance, which connects it to the Vertebræ.

It is compoſed of Acini, which form ſmall Glands or Lobes; and theſe are connected looſely by Cellular Subſtance, in ſuch a manner as to give an appearance of uniformity and ſmoothneſs to the External Surface.

The *Arteries* of the Pancreas are derived, partly from the Hepatic, but chiefly from the Splenic, by ſeveral ſmall Branches, which paſs at various places into its Subſtance, in a tranſverſe direction.

The *Veins* correſpond in name and courſe with the Arteries, and aſſiſt in forming the Vena Portæ.

The *Lymphatics* run to the Splenic Plexus, and terminate in the Thoracic Duct.

The *Nerves* of the Pancreas are ſmall: Like thoſe of the other Viſcera of the Abdomen, they are derived from the Great Sympathetic and Eighth Pair.

From the different Acini of the Pancreas, ſmall Ducts ariſe, which join into larger ones running tranſverſely in the Subſtance of the Pancreas, and forming a common Duct, called *Ductus Pancreaticus.*

The *Pancreatic Duct*, termed alſo *Ductus* Wirtsungi, after the diſcoverer of it in the Human Body, is remarkably thin, of a white colour, and ſemi-tranſparent.

It begins at the Left Extremity of the Pancreas, runs in the ſubſtance of the Gland, a little below its middle height, and becomes gradually larger in conſequence of receiving the different Branches which compoſe it,—and is at laſt about the ſize of a Raven's-quill.

At the Right Extremity of the Pancreas, it receives the Principal Duct of the Pancreas Minus, and terminates obliquely in the Duodenum along with the Ductus

 Communis

Communis Choledochus.—In ſome rare caſes, however, it terminates at a little diſtance from the Biliary Duct; and ſometimes alſo, the Duct of the Pancreas Minus ends ſeparately in the Duodenum.

The Pancreas ſecretes a *Liquid* or *Juice*, reſembling Saliva in quality and appearance, and diſcharges it by its Excretory Duct into the Duodenum.

The *Pancreatic Juice* incorporates the Bile with the Alimentary Maſs, and may be ſaid alſo to anſwer the ſame purpoſe to the contents of the Inteſtines, which the Gaſtric Juice does to thoſe of the Stomach;—or, it finiſhes that digeſtive Proceſs in the Inteſtines which was begun in the Stomach.

OF THE

ORGANS OF URINE AND GENERATION

IN THE MALE.

KIDNEYS.

THE *Kidneys* are two Glandular bodies, of a pale red colour, ſituated in the upper and back part of the Abdomen, in the Lumbar Region.

They are placed one on each ſide of the Spine, extending from the Eleventh Pair of Ribs to near the Oſſa Ilia; and reſt upon the Diaphragm, large Pſoæ, Quadrati Lumborum, and Tranſverſales Abdominis Muſcles.

The Right Kidney is ſituated at the under and back-part of the large Lobe of the Liver, behind the Colon, and is commonly a very little lower than the left.

The left Kidney is placed at the under and back-part of the Spleen, and behind the left parts of the Stomach, Pancreas, and Colon.

The Kidney is about five or ſix fingers breadth in length, but conſiderably leſs from the outer to the inner ſide, and leſs than that ſtill from before backwards; or, it is compared in ſhape to a *French* or *Kidney bean.*

It is rounded anteriorly, flattened poſteriorly, convex and uniform at its outer margin, and has a deep depreſſion or Sinus towards the Vertebræ, ſurrounded with unequal edges, where the Renal Veſſels and Nerves enter.

It is a little broader behind than before, and a little broader and more curved above than below, from which circumſtance, but more particularly from the diſpoſition of the Veſſels to be afterwards mentioned, it is eaſy to diſtinguiſh the Right from the Left Kidney when taken out of the Body.

The

The Right Kidney is connected to the Liver and Duodenum, the Left to the Spleen, and both to the Muſcles on which they are placed, and to the Renal Glands and Colon, by Cellular Subſtance and by the Peritoneum.

They are alſo connected to the Aorta and Vena Cava by the Blood veſſels, and to the Bladder of Urine by the Ureters.—They accompany the motions of the Liver and Spleen, in the different ſtates of Reſpiration.

Each Kidney is ſurrounded by looſe Cellular Subſtance, which commonly contains a conſiderable quantity of Fat, from which it is termed *Tunica Adipoſa*.

The *Tunica Adipoſa* covers not only the Kidney, but large Veſſels, and defends them from the preſſure of the ſurrounding Viſcera.

Under the Tunica Adipoſa, there is a *Membrane* compoſed of the original proper Coat and Cellular Subſtance incorporated, which adheres cloſely to the Kidney, and is reflected over the edges of the Sinus, to be joined to the Pelvis and large Veſſels.

The ſubſtance of the Kidney is commonly ſmooth and uniform, though ſometimes it is irregular, in conſequence of the Lobes which originally form it not being completely incorporated.—It conſiſts of an outer part called *Cortical*, and an inner termed *Medullary*.

The *Cortical Subſtance*, termed alſo *Secerning*, ſurrounds the Kidney, and forms about a third of its breadth;—it likewiſe ſends in Proceſſes or Partitions, which ſeparate the Medullary parts from each other.

The *Medullary*, termed alſo *Uriniferous Subſtance*, is of a redder colour than the former, and is divided into a number of diſtinct Columns, each of which terminates in a projection called *Papilla*, or *Proceſſus Mammillaris*.

The *Papillæ* are merely the continuation of the Uriniferous part; though frequently conſidered as a third diviſion of the ſubſtance of the Kidney.

Each Kidney has one, and ſometimes more *Arteries*, which run tranſverſely from the Aorta, and a Vein ſtill larger, which terminates in the Cava.—They enter at the Sinus of the Kidney, and are included in Cellular Subſtance, which accompanies them throughout their courſe.

The Right Renal Artery is longer than the Left, in conſequence of the Vena Cava, behind which it paſſes, being placed upon the Right Side of the Aorta.

The Artery, as it approaches the Kidney, is divided into

into Branches, which are afterwards minutely diſtributed through the Cortical Subſtance, forming Arches and Anaſtomoſes;—but theſe are found to be much leſs frequent than are commonly deſcribed.

The ſmall Branches, after turning and winding in various directions, paſs partly towards the Surface of the Kidney, where they form irregular *Stars*, ſome of which ſupply the proper Membrane.

Others turn inwards in a waving direction, and form *Corpuſcles*, which are diſpoſed ſomewhat after the manner of *Cluſters of ſmall Berries*, which can only be ſeen diſtinctly by the aſſiſtance of Glaſſes, after a minute injection.

The *Corpuſcles* were conſidered by Dr Nichols as the Globular terminations of Blood-veſſels, and termed by him *Globuli Arteriarum Termini*;—but theſe Globuli were afterwards obſerved by Mr Hewson to conſiſt of ſmall Veſſels intimately intermixed.

The *Veins* returning from the extremities of the Arteries unite in the Cortical Subſtance of the Kidney.

The Branches of the Renal Vein are much larger than thoſe of the Artery, but correſpond with them in their courſe.—They form a large Trunk on each ſide, which lies anterior to the correſponding Artery, and runs tranſverſely to the Cava;—the left, which is the larger of the two, paſſing acroſs the fore-part of the Aorta.

The *Lymphatics* of the Kidney run from without inwards, and terminate in the Lumbar Glands, and afterwards in the Thoracic Duct.—The Superficial Lymphatics are ſo ſmall, as ſeldom to be ſeen, excepting in the diſeaſed ſtate of the Kidney.

The *Nerves* are from the Semilunar Ganglion formed by the great Sympathetic and Eighth Pair. They form a Plexus which ſurrounds the Blood-veſſels, and accompanies them in the Kidney.

From the minute extremities of the Renal Artery, in the Corpuſcles ſeated in the Cortical Subſtance, the *Uriniferous Tubes* ariſe. They are mixed with ſome extremely ſmall Blood-veſſels, and conſtitute the Medullary Subſtance of the Kidney.

By degrees they unite into larger Tubes, which run in a radiated manner, the direction being from the outer edge or circumference, towards the inner part or Cavity of the Kidney.

The radiated Tubes, becoming ſtill larger in their paſſage,

paſſage, terminate in the *Papillæ*, which are of a compreſſed conical form, and are at a little diſtance from each other.

The *Papillæ* are twelve or more in each Kidney, the number varying according to that of the original Lobes of which the Kidney is compoſed, and likewiſe from ſome of the Papillæ being incorporated with each other.

Upon the points of the Papillæ are the terminations of the Uriniferous Tubes,—large enough to be diſtinguiſhed by the naked Eye,—through which the Urine diſtils from the Subſtance of the Kidney.

Round the root of each Papilla, a Membranous Tube ariſes, termed *Infundibulum* or *Calix*, which receives the Urine from the Papillæ.

The *Infundibula* are commonly the ſame in number with the Papillæ; the number, however, varying in different ſubjects, two or more of the Papillæ ſometimes opening into the ſame Infundibulum.

The Infundibula join into two or three larger Trunks, which afterwards form a Dilatation of conſiderable ſize, of the ſhape of an inverted Cone, and termed *Pelvis* of the Kidney.

The *Pelvis* is placed partly within, but the greater part of it without the body of the Kidney, and contracts into a long Tube, about the ſize of a Writing-pen, called *Ureter.*

The *Ureters* are commonly one to each Kidney, though in ſome rare inſtances they are double on one or on both ſides.

The Artery of the Kidney is placed uppermoſt,—the Vein in the middle and fore-part,—and the Pelvis and beginning of the Ureters at the under and back-part of the Blood-veſſels.

The Ureters deſcend obliquely inwards behind the Peritoneum, and go over the great Pſoæ Muſcles and Iliac Veſſels, oppoſite to the anterior and lateral parts of the Os Sacrum.

They paſs afterwards into the Pelvis, and terminate in the under, outer, and back-part of the Bladder.

In their deſcent, they are not ſtraight, but form turns which are commonly compared to the Italic *ſ*;—neither are they cylindrical, as they form ſlight dilatations and contractions in their courſe, two of which contractions are more obſervable in their paſſage over the Pſoæ Muſcles, and at their inſertion into the Bladder.

The

The Ureters are covered anteriorly by the Peritoneum, and composed of an *External Membranous Coat*, a *middle Muscular* one, formed chiefly of circular Fibres, and an *Internal Coat*, sometimes called *Villous*.

The Inner Coat is very Vascular, and is perforated by the Mouths of small Ducts, which line it with a Mucus to defend it from the Urine.

The Vessels and Nerves of the Ureters are from those of the contiguous parts.

The *Use* of the Kidneys is to secrete the Urine from the Blood, and convey it by means of the Ureters to the Bladder.

RENAL GLANDS.

The *Renal Glands*, termed also *Capsulæ Atrabilariæ*, *Capsulæ Renales*, *Renes Succenturiati*, and *Glandulæ Supra-renales*, are two small, flat, Glandular-like bodies, of a dark-yellow-colour, lying in the upper and back-part of the Abdomen.

They are situated at the upper, inner, and fore-part of the Kidneys, over the large Psoæ Muscles and Diaphragm, and higher than the Renal Vessels.

They are of an irregular figure, and are about a couple of fingers-breadth in length, but much larger, proportionally, in the Fœtus than in the Adult.

The Right one is connected to the Liver, the Left to the Spleen and Pancreas, and both to the small Muscle of the Diaphragm, and to the Psoæ Muscles and Kidneys, by Cellular Substance. They are likewise retained by numerous Vessels and Nerves which are spread over them.

They are surrounded by Cellular Substance, which is part of the Tunica Adiposa of the Kidneys, and have a thin proper Coat, which adheres firmly to them.

They are frequently observed to be hollow, and to contain a dark-coloured Bilious-like matter, which is considered by many Anatomists as the Internal, very Vascular and tender parts melted down by putrefaction.

Their *Arteries* come from those of the adjacent parts, particularly from the Renal, and also from the Aorta, and Diaphragmatic Arteries.

Of the principal *Veins*, the Right goes to the Vena Cava, and the Left to the Renal Vein.

The *Lymphatics* go chiefly to those of the Kidneys.

The

The Nerves come principally from the Renal Plexus.

They have no Excretory Ducts.

The Renal Glands have been ſuppoſed to furniſh Lymph for the dilution of the Blood returning in the Renal Veins, after the ſecretion of the Urine;

Or,—to reſtore to the Blood of the Vena Cava the irritable parts which it loſes in the ſecretion of the Urine and Bile;

Or,—to convey ſomething uſeful to the Thoracic Duct;

Or, in the Fœtus,—to divert the Blood from the Kidneys, and thereby leſſen the quantity of Urine.

But their *uſe* is ſtill undiſcovered; though it is ſuppoſed from their vicinity to the Kidneys, not only in Man, but in many other animals, that they are ſubſervient to theſe Organs, and particularly to thoſe of the Fœtus.

VESICA URINARIA.

THE *Veſica Urinaria*, or *Bladder of Urine*, is a large Sac ſituated in the Pelvis of the Abdomen, in the bottom of the Hypogaſtric Region.

It is placed in the fore-part of the Pelvis, behind the Oſſa Pubis, and before the upper, and above the under portion of the Inteſtinum Rectum.

When empty, it is contracted into a ſmall ſize, which occupies the under and fore-part of the Pelvis; but, when fully diſtended, it riſes above the brim of that Cavity, and ſometimes aſcends to within a little diſtance of the Umbilicus.

When moderately dilated, it is of a roundiſh, or irregular oblong form, but a little flattened before, more convex behind, and broader at its anterior and poſterior, than towards its lateral parts,—a little more capacious, alſo, below than above, eſpecially at its poſterior part.

It is diſtinguiſhed into *Fundus*, *Body*, and *Cervix*, the firſt of which is placed upwards and a little forwards;—the laſt at the under and fore-part.

It is connected below to the Rectum, and at the ſides to the Pelvis by the reflected Peritoneum and Cellular Subſtance, the former of which, when the Bladder is empty, has the appearance of lateral Ligaments.

It is attached, at the fore-part of its Body, by Cellular Subſtance, to the Oſſa Pubis, without the intervention of the Peritoneum.

It

It is alſo fixed to the Umbilicus by three Ligaments ſituated between the Peritoneum and Abdominal Muſcles. —They are formed of the Urachus running upwards from the Fundus, and the ſhrivelled Umbilical Arteries paſſing obliquely from the ſides of the Bladder.

The firmeſt connection is by means of a Ligamentous expanſion, which runs from each ſide of the Neck of the Bladder and Proſtate Gland, to be fixed to the inſide of the Arch of the Oſſa Pubis.—It is connected, alſo, at this place, to the Penis, by the Urethra.

It is compoſed of different *Coats* joined together by Cellular Subſtance, the firſt of which is only a partial one continued from the Peritoneum.

The *Peritoneal* or *Common Coat*, recedes from the Abdominal Muſcles at the top of the Pubes, and paſſes over the ſuperior, and down upon the poſterior and lateral parts of the Bladder, to near the termination of the Ureters, where it is about a finger's-length from the Anus,— and is there reflected upon the Rectum and back-part of the Pelvis.

When the Bladder is much diſtended, it carries the Peritoneum with it, and leaves a ſpace between that Membrane and the Pubes, of ſuch length, that an inciſion has frequently been made here, and large Calculi extracted from the Bladder, without penetrating into the Abdomen, or wounding the Peritoneum.

The *ſecond Coat* is termed *Muſcular*.—It is compoſed of diſtinct Fleſhy Fibres, interwoven with each other, and forming Faſciculi.

The External Fibres run chiefly in a longitudinal direction, and are connected, at the under and fore-part of the Bladder, with the Oſſa Pubis.

More internally, are Fibres which run in all directions, and are intermixed with each other in the form of Net-work.

The Muſcular Fibres are contracted about the Neck of the Bladder, and form what has been termed *Sphincter Veſicæ*;—theſe, however, are merely the continuation of the other Fibres.

The Muſcular Coat, by its contraction, occaſions the complete evacuation of the Bladder.—The Fibres about the Neck of the Bladder, by acting ſeparately from the reſt of the Muſcular Coat, prevent the involuntary diſcharge of the Urine.

 The

The Cellular Subſtance, under the Muſcular Fibres, is frequently termed *Nervous Coat.*

The *Inner Coat*, though often called *Villous*, is ſmooth like the inſide of the Peritoneum, and, though thin, is ſo denſe as to prevent the exſudation of the Urine.

This Coat is rendered ſomewhat unequal by the projecting of the Faſciculi of the Muſcular Fibres; and when the Bladder is empty, it forms large wrinkles or Rugæ.

The inſide of the Bladder is very irritable, in conſequence of which a deſire to expel the Urine is occaſionally excited. It is lined, however, by a Mucus, diſcharged from its Arteries, which prevents it from being conſtantly irritated by that Fluid.

The under part of the Bladder is perforated by *three Openings*, of which one is placed anteriorly, and two poſteriorly.

The Anterior Opening is the beginning of the Paſſage called *Urethra*, and is ſurrounded by the Neck of the Bladder.

It comes off almoſt at a right angle from the lower part of the Bladder, without any tapering of that Viſcus.

The other two openings are formed by the termination of the Ureters, which run obliquely forwards and inwards, between the Muſcular and Inner Coat of the Bladder.

They terminate in the Bladder at a little diſtance from each other, and at the ſame diſtance behind the beginning of the Urethra, each by a ſomewhat oval Opening, which is more contracted than the Ureter is immediately above it.

The *Arteries* of the Bladder come from various ſources, but chiefly from the Umbilical and Pudenda Communis.

The *Veins* return to the Internal Iliacs:—They form a Plexus of conſiderable ſize upon each ſide of the Bladder.

The *Lymphatics* accompany the principal Veins on the Bladder, and, at the under part and ſides, paſs into the Iliac Glands.

The *Nerves* are Branches of the Great Sympathetic and Sacral Nerves.

The Bladder receives the Urine from the Ureters by drops, and ſometimes by ſmall thread-like ſtreams or ſquirts, till by its accumulated quantity and acrimony, it forces that Viſcus to contract and expel it.

The

The Urine is expelled, partly by the contraction of the Bladder itſelf, and partly by the action of the Abdominal Muſcles and Diaphragm preſſing the Inteſtines againſt the Bladder.

The frequency of the evacuation depends upon the ſize and ſenſibility of the Bladder, upon the quantity of Urine ſecreted, and the degree of acrimony it poſſeſſes.

TESTES.

THE *Teſtes*, formerly termed *Didymi* or *Gemini*, are two Glandular Bodies ſituated in the Cavity of the Scrotum.

The *Scrotum*, which furniſhes an external covering to the Teſtes, is a continuation of the common Integuments, has the ſame Structure with the Skin in general, but is more plentifully ſupplied with Sebaceous Follicles, has no Fat in its Cellular Subſtance, and is occaſionally relaxed and corrugated in a greater degree than the Skin in the other parts of the Body.

Upon the Surface of the Scrotum, there is a ſuperficial, longitudinal projecting *Line*, which divides it into two equal parts, and has the name of *Raphe*.

The inner Surface of the Scrotum is lined with Cellular Subſtance, which is firmer and more Vaſcular than in other places.

The Cellular Subſtance of the Scrotum, in conſequence of its redneſs, Fibrous appearance, and ſuppoſed power of contraction, has, by many Anatomiſts, been conſidered as a Muſcle, and called *Dartos*.—This opinion, however, has of late years been rejected.

The Cellular Subſtance of the Scrotum involves each Teſticle ſingly, and forms a Septum or Partition between the two, which prevents Air or Water from paſſing readily from one ſide of the Scrotum to the other.

The *Veſſels* and *Nerves* of the Scrotum are chiefly from thoſe of the neighbouring parts.

The Blood-veſſels are Branches of the Pudendal and Femoral.

The *Lymphatics* go moſtly to the Inguinal,—but ſome of them accompany thoſe of the Teſtes to the Lumbar Glands.

The anterior part of the Scrotum derives Nerves from the Lumbar, and the poſterior from the Pudendal Nerves.

The Scrotum aſſiſts in ſupporting and protecting the Teſtes.

Under the Scrotum are two *Membranes* or *Coats*, proper to each of the Teſtes, the one termed *Vaginalis*, the other *Albuginea*.

The *Tunica Vaginalis*, named from its forming a ſheath, is of the ſame nature with the Peritoneum, being originally a Proceſs of that Membrane, which in the Fœtus deſcends with the Teſticle from the Abdomen.

It forms a ſhut Sac, which has no communication with any other part.

It incloſes the Teſticle, as the Pericardium does the Heart, and lies looſe every where, excepting behind, where it is *continuous* with the Albuginea.

It is conſiderably larger than the Teſtis which it incloſes, reaching as far above and below it as to allow it a certain degree of motion.

It is connected by its external Surface to the Cremaſter Muſcle, and partly, by means of that, to the inner Surface of the Scrotum.

It aſſiſts the Cremaſter in ſupporting the Teſtis, and, by being conſtantly moiſtened within by a Fluid exhaled from its Surface, and from that of the Tunica Albuginea, it allows the Teſticle to move eaſily.

The *Tunica Albuginea*, ſo called from its white colour, is, like the former Coat, a continuation of the Peritoneum, and inveſts the Body of the Teſticle cloſely.

It is a thick, ſtrong, denſe, and inelaſtic Membrane, of a gliſtening appearance.

It is remarkably ſmooth on the outſide, but internally it is rough and unequal, adhering every where firmly to the Body of the Teſtis.

It covers both the Teſtis and Epididymis, connects them to each other, gives ſtrength to them, and conducts their Veſſels in the manner the Meſentery does thoſe of the Inteſtines.

The Body of the Teſtis is of a yellowiſh colour, and has a Pulpy appearance,—is of an oval form, a little flattened at its outer and inner Surface;—and frequently one Teſticle is a little larger than the other.

The Teſtes are placed obliquely, with one end upwards and forwards, and the other end backwards and downwards.

At the outer and back-part of the Teſtis, there is an Appendix named *Epididymis*, from its ſituation upon the Teſtis

Teſtis or Didymis, which is incloſed in the ſame covering with the Teſtis itſelf.

The Epididymis begins at the upper part of the Teſticle, immediately above the entry of the Blood-veſſels; and this part of it being large and of a round form, is termed *Globus Major*, or *Head* of the Epididymis.

In its deſcent, it becomes ſomewhat ſmaller and flatter, and is attached behind to the Body of the Teſticle, where the Blood-veſſels go in; but forwards it is looſe, the Tunica Albuginea dipping in this place, and forming a Cavity or Pouch.

The under part of it becomes more firmly attached to the Body of the Teſticle, and forms the *Cauda*, or *Globus Minor;* it is then turned backwards upon itſelf, after which it ſends out the Excretory Duct of the Teſticle.

The Body of the Teſtis has numerous Arteries, Veins, Abſorbents, and Nerves; but is principally compoſed of a collection of minute, tender, elaſtic Filaments, intricately convoluted, termed *Tubuli Seminiferi*, or *Vaſa Seminalia.*

The *Tubuli Seminiferi* are diſpoſed in Faſciculi or Bundles, between Partitions, which are formed of Blood-veſſels and Cellular Subſtance.

Theſe Septulæ begin at the root or *Nucleus*, ſituated at the back-part of the Teſticle, ſometimes termed *Corpus Highmorianum*, and extend in a radiated manner to the Tunica Albuginea.

The Teſtis is fixed behind by its Veſſels, which are collected into a *Cord* termed *Spermatic*, but is looſe and free before, to prevent it from being pinched.

The *Spermatic Cord*, properly ſo called, extends from the Ring of the External Oblique Muſcle to the Body of the Teſtis, and is compoſed of the Trunks of the different Veſſels belonging to the Teſticle, and of a quantity of Cellular Subſtance.—The Cord is covered by the Cremaſter Muſcle; and within this, by the ſame Proceſs of the Peritoneum which forms the Tunica Vaginalis Teſtis. This part of the Proceſs, however, is ſo incorporated with the common Cellular Subſtance of the Cord, as to appear to form part of it.

The under part of the Vagina of the Cord is ſeparated by a Partition formed by the upper end of the Vaginal Coat of the Teſticle, and by condenſed Cellular Subſtance, ſo that no liquor can paſs eaſily from the Cord to the Teſticle, and *vice verſa*.

The

The *Arteries* of the Testes, termed *Arteriæ Spermaticæ*, and *Arteriæ Preparantes*, arise, one on each side, from the fore-part of the Aorta, a little below the Renal Arteries.

The *Spermatic Artery* crosses over the Psoas Muscle and Ureter, and descends, behind the Peritoneum to the under part of the Abdomen.

At the lower part of the Abdomen, it perforates the Ring of the External Oblique Muscle, and passes in the Spermatic Cord to the Testicle.

In is descent, it gives branches to the adjacent parts, and is so interlaced with those of the corresponding Vein, as to have been supposed by the Ancients to have large lateral communications with them.

After passing the Ring, it divides into Branches which go to the Testis at its posterior edge. They are partly dispersed upon the Epididymis, but the larger Branches run in a serpentine direction into the Substance of the Testis, where they are minutely distributed upon the Surface of the Seminal Tubes.

Besides the Spermatic Artery, there is a smaller one from the Hypogastric, which accompanies the Vas Deferens, and is dispersed along with the other Artery.

The *Veins* are much larger than the corresponding Arteries, and have several Valves in them, especially without the Abdomen.

They form a *Plexus*, which accompanies the Artery on each side, and is sometimes called *Corpus Pampyniforme*, being compared to the shoots of the Vine, or *Corpus Pyramidale*, from giving a Pyramidal form to the Cord.

The Plexus ascends in the Abdomen, and upon the Surface of the Psoas Muscle; and about the part where it recedes from the Artery, it forms a single Trunk, which, in the right side, terminates in the Vena Cava, nearly opposite to the Artery, and, in the left side, goes into the Renal Vein.

There is also a small inferior Spermatic Vein, which accompanies its Artery, and ends in the Hypogastric Vein.

The *Tubuli Seminiferi* in the Body of the Testicle consist of numberless extremely minute Ducts, which are of a Cylindrical form, have no division into Branches, and when drawn out, are found to be several feet in length.

They

They are firſt collected into Bundles, between the Septulæ of the Teſticle, and theſe again into others ſtill ſmaller, each of the ſmaller being formed of a ſimple Tube, coiled up into a Conical form, with its Baſe forwards, and its Apex towards the poſterior edge of the Teſticle.

From the convoluted Seminal Tubes, an equal number of ſtraight Veſſels are ſent out at the back-part of the Teſticle, under the name of *Vaſa Recta.*

At the upper and back-part of the Teſticle, the Vaſa Recta communicate, and form an irregular Plexus or Net-work, called *Rete Vaſculoſum Teſtis.*

The *Rete Teſtis* ſends out from twelve to eighteen ſtraight Tubes, termed *Vaſſa Efferentia*, which carry the Semen from the Teſticle to the Epididymis.

The *Vaſſa Efferentia* ſoon become convoluted, and form Conical Bundles, termed *Coni Vaſculoſi.*

The *Coni Vaſculoſi* are firmly connected by Cellular Subſtance, and are obſerved by DR MONRO, in his Treatiſe *De Teſtibus*, to compoſe ſomewhat more than a third part of the Epididymis.

The Vaſcular Cones gradually unite into a ſingle Tube, which conſtitutes the reſt of the Epididymis, and though only about the ſize of a Hog's Briſtle, tranſmits the whole of the Semen.

The ſingle Tube becomes larger in its courſe and leſs convoluted, and at laſt, expanding its convolutions, it comes out greatly increaſed in ſize, and almoſt in a ſtraight direction, under the name of *Vas Deferens.*

Beſides the Ducts already deſcribed, a *Vas Aberrans* is ſometimes obſerved, which is one of the Vaſcular Cones, wandering off, and terminating in the Epididymis lower than uſual.

At other times, the ſame kind of Veſſel forms a *Proceſſus Cæcus*, or blind Duct, with a dilated Extremity which does not communicate with any other part.

VESI-

VESICULÆ SEMINALES AND PROSTATE GLAND.

THE *Vesiculæ Seminales* are two small Pyriform Receptacles, situated between the under and lateral parts of the Bladder and the Intestinum Rectum,—about three fingers-breadth in length, and the third part of that in breadth, and a little flattened.

They are at a considerable distance from each other behind, but anteriorly they converge, and become contiguous, forming a sharp angle.

Each of them is composed of a *convoluted Tube*, with *irregular Processes*, and surrounded by a quantity of tough Cellular Substance, and by many Vessels and Nerves.

Internally, they have a *Villous appearance*, and are formed of irregular *Cells* which correspond with the irregularities on their External Surface, and communicate freely with each other.—Their shape, size, and general appearance, however, vary in different subjects, and not unfrequently in the same person.

Between the Vesiculæ Seminales, the ends of the Vasa Deferentia, now become larger and Cellular, pass forwards till they arrive at the Prostate Gland, where each Vas Deferens joins the Vesicula of that side, and communicates so freely with it, that injected Fluids readily pass from the one to the other.

From each Vesicula Seminalis and Vas Deferens of the same side, a *small Canal*, about a Finger's-breadth in length, passes out, which is firmly connected to its fellow, without communicating with it, and becomes gradually smaller, piercing, obliquely, the Prostate Gland, and terminating in the under part of the Neck of the Bladder.

The *Orifices* of these Canals are separated from each other by a *Caruncula*, or round Projection of the Membrane of the Urethra, termed *Veru-montanum*;—or, from being broad behind and rostriform before, it is compared to the Head and Beak of the *Wood-cock*, and called *Caput Gallinaginis*.

The Vesiculæ Seminales are commonly considered as Reservoirs of the Semen, receiving it from the Vasa Deferentia, and afterwards,—by a power inherent in themselves,

felves, affifted by the action of the neighbouring Mufcles, particularly of the Levatores Ani,—propelling it to the Urethra.

The Semen is prevented from paffing into the Bladder, the opening from it being fhut while that Fluid is expelled.

Various experiments have been made on the Veficulæ Seminales by the late MR HUNTER,—from which he was of opinion,—that they are not Refervoirs of Semen, but Glands, fecreting a particular Mucus;—that, with other parts, they are fubfervient to the purpofes of Generation;—and that the Bulb of the Urethra is the receptacle of the Semen, in which it is accumulated previous to its ejection.

The *Proftate Gland*, named from its fituation before the Veficulæ Seminales, lies immediately behind the under end of the Symphyfis of the Pubis, and refts upon the Inteftinum Rectum.

It furrounds and clofely embraces the Neck of the Bladder, or beginning of the Urethra; but the greater part of it is placed pofteriorly and laterally, having a Lobe projecting on each fide.

It is about the fize of a Walnut, and of the figure of a Spanifh Chefnut,—or it refembles a Heart as commonly painted on Playing-cards, with the Bafe towards the Bladder, and the Point towards the Penis.

It has a Spongy Subftance, but is one of the firmeft Glands of the Body, and generally fends out *ten* or *twelve Ducts*, which open obliquely at the beginning of the Urethra, at the fides of the Caput Gallinaginis, and near the termination of the Seminal Ducts.

From the Ducts of the Proftate Gland, a thin white Liquor is difcharged,—from the fame caufes, and at the fame time with the Semen,—into the Urethra, and is fuppofed to be ufeful in the procefs of Generation;—or, according to fome Authors, this Fluid facilitates the paffage of the Semen through the Urethra.

The Blood-veffels, Abforbents, and Nerves of the Veficulæ Seminales and Proftate Gland, are in common with thofe of the parts which furround them.

PENIS.

THE *Penis*, which has obtained a variety of other names, ſuch as *Membrum Virile*, *Mentula*, &c. conſiſts of three Spongy Subſtances, two of which form the upper part and ſides, or Body of the Penis, and are termed *Corpora Cavernoſa Penis*, the third ſurrounds the Urethra, and has the name of *Corpus Spongioſum Urethræ.*

The Penis is covered with a continuation of the common Integuments, which are thinner than elſewhere, and, inſtead of Fat, there is, as in the Scrotum, a Reticular Subſtance only under the Skin.

At the anterior extremity of the Penis, the Integuments form a looſe fold, termed *Prepuce*, which is connected to the anterior and under part, or *Glans* of the Penis, by a triangular fold, called *Frænum Preputii.*

The *Corpora Cavernoſa Penis* reſemble two equal but irregular Cylinders, cloſely applied to the ſides of each other, and each covered by a ſtrong, elaſtic, Ligamentous Sheath, the Fibres of which run in a tranſverſe, and partly in an oblique direction.

They ariſe one on each ſide, by two blind Conical extremities, called their *Crura*, from the inner part of the Crura of the Oſſa Iſchia and Oſſa Pubis, to both of which they are very firmly connected by Ligamentous Subſtances.

At the under part of the Symphyſis of the Pubis, they are united to each other, and continue ſo till they reach the Glans, where they terminate in a rounded extremity.

At the upper part of the root of the Penis, the Ligamentous Sheath of the Corpora Cavernoſa ſends up a Proceſs of a triangular form, to be connected to the Symphyſis of the Oſſa Pubis, under the name of *Ligamentum Suſpenſorium*, by which the Body of the Penis is ſupported, and prevented from preſſing too much upon the Scrotum.

The Corpora Cavernoſa leave a *Groove* above, for the principal Vein of the Penis, and a *Channel* below for the Cavernous Subſtance of the Urethra.

The internal ſubſtance of the Corpora Cavernoſa conſiſts of *looſe reticular Plates*, ſomewhat ſimilar to the Cancelli

celli in the ends of long Bones, and, like them, readily communicating with each other.

Upon the Cells of the Corpora Cavernoſa, the Arteries are plentifully diſperſed, and open freely into them, the Blood of the Arteries tinging the Cells in the relaxed ſtate of the Penis, and filling them completely when it is diſtended.

The Corpora Cavernoſa are united to each other by a *Septum* or *Partition*, formed by a continuation of the Elaſtic Ligament which covers theſe Bodies.

The *Septum Penis* is compoſed of Cords, extending, nearly in a parallel direction, from the Dorſum, or upper part of the Penis, to the Corpus Spongioſum Urethræ.

Between the different Cords, *Fiſſures* are left, through which the Blood, or an injected Fluid, paſſes without obſtruction from one of the Corpora Cavernoſa to the other.

The *Corpus Spongioſum Urethræ* is ſituated under and between the Corpora Cavernoſa Penis, but projects conſiderably beyond them.

It begins a little behind the part where the Corpora Cavernoſa are united, adheres to them by condenſed Cellular Subſtance, and terminates at the anterior extremity of the Penis.

It has an external covering ſimilar to that of the Corpora Cavernoſa Penis, but more delicate and more of a Membranous appearance.

The poſterior part of the Corpus Spongioſum is dilated into a *longitudinal Prominence*, of a *Conical* form, ſituated within the Skin of the Perineum, and termed *Bulb* of the Urethra. It extends from the root of the Penis to near the Anus, projects moſt towards the under and back-part, and is divided anteriorly by a Septum.

The Corpus Spongioſum is continued along the under part of the Corpora Cavernoſa, and at the end of theſe expands into the Subſtance called *Glans Penis*, which covers and incloſes the ends of the Corpora Cavernoſa.

The *Glans* or *Nut*, named from its reſemblance to an Acorn, is ſeparated from the Corpora Cavernoſa by a continuation of the Ligamentous Sheath which covers them, and is encircled at its poſterior part by a prominent margin, called *Corona Glandis*, behind which is a Cervix or Neck.

The Surface of the Glans is covered with a *Plexus*, chiefly of Venous Veſſels, and with *Nervous Papillæ*,

which give it its ſenſibility; and theſe are incloſed in a fine Membrane continued from the inſide of the Prepuce.

About the Cervix and Corona of the Glans, are many *Follicles*, termed *Glandulæ Odoriferæ*, which diſcharge a Sebaceous Matter, to preſerve the ſenſibility of the Glans, and allow the Prepuce to move backwards and forwards upon it with facility.

The Internal Structure of the Bulb of the Urethra and Glans of the Penis, is of the ſame nature with that of the Corpora Cavernoſa; and the Internal Structure of the reſt of the Corpus Spongioſum differs from that of the Corpora Cavernoſa only in this, that the Cells are ſmaller and of a more delicate texture.—Some Anatomiſts conſider the greater part of the Corpus Spongioſum as merely a Plexus of convoluted Veins.

The *Urethra*, named from the Urine paſſing through it, is a long Canal, the Diameter of which is nearly equal to that of a writing-pen. It begins at the under and fore-part of the Bladder, runs through the Corpus Spongioſum, and terminates in the point of the Penis by a longitudinal Orifice.

At its origin, it deſcends a little, and then paſſes forwards, under the Symphyſis of the Oſſa Pubis, to which it is cloſely connected by Cellular Subſtance: It then aſcends at the under and fore-part of the Oſſa Pubis, varying in the remainder of its courſe, according to the different degrees of relaxation or diſtenſion of the Cells of the Penis.

There are commonly *three Dilatations* in the Urethra; one of which is at the Proſtate Gland, the ſecond in the Bulb of the Urethra, and the third about the beginning of the Glans.

In general, it has alſo the ſame number of *ſlight Contractions*; the firſt at its origin from the Bladder, the ſecond between the point of the Proſtate Gland and Bulb of the Urethra, and the third at the point of the Glans.

Between the point of the Proſtate Gland and part where the Urethra penetrates the Corpus Spongioſum,—including nearly the ſpace of a Finger's-breadth,—the Urinary paſſage is entirely *Membranous*, and covered only with the common Cellular Subſtance.

At the upper ſide of the Bulb, the Urethra enters the Corpus Spongioſum, in which it is incloſed to its termination in the point of the Penis.

The

The inside of the Urethra is lined by a very *Vascular* and *sensible Membrane*, which is observed to possess a certain degree of contractility, and is therefore presumed by several Anatomists to be endowed with Muscular Fibres.

Between the Corpus Spongiosum and Membrane which lines the Urethra, especially towards the Septum of the Penis, numerous *Lacunæ* of different sizes are situated, one or two of which in particular, next the Glans, are often considerably larger than the rest.

They run in a longitudinal direction from behind forward, and perforate the Urethra by Orifices large enough to admit a Bristle.—They discharge a bland Mucus for the defence of the Urethra.

Besides the Lacunæ, two small bodies, each about the size of a Garden-pea, are frequently met with, and are termed, from their discoverer, COWPER'S *Glands*.

They are situated at the sides of the Membranous part of the Urethra,—between its Bulb and the point of the Prostate Gland,—and covered by the Accelerator Muscles.

When present, they are observed to discharge from their Ducts into the Urethra, a Fluid which is supposed to serve the same prupose with that of the Lacunæ.

The *Arteries* of the Penis are chiefly from the Pudicæ Communes, which are Branches of the Internal Iliacs, and partly from the Femoral Arteries.

Each of the Pudic Arteries having passed out of the Pelvis, through the great Notch of the Os Ilium, runs between the Sacro-Sciatic Ligaments to the inner side of the Tuber Ischii, from which it passes along the Crus of that Bone, and of the Os Pubis, to the root of the Penis.

In its course, it furnishes Branches to the adjacent parts, and afterwards gives off three principal Branches, which belong to the Penis:—One of these goes to the Bulb of the Urethra, to be dispersed in the Corpus Spongiosum;—the other two, which are larger than the former, go to the Body of the Penis, one of them penetrating its Crus, and running in the centre of the Corpus Cavernosum; the other passing between the Symphysis Pubis and joining of the Crura Penis, and extending along the Dorsum as far as the Corona Glandis.

The Branches of the Femoral Artery to the Penis communicate with those of the former, and are chiefly dispersed upon the Integuments.

The Arteries of the Penis are divided into minute Ramifications,

mifications, which communicate with each other, and with their fellows on the oppofite fide, and terminate partly in the correfponding Veins, and partly in the Cells of the Penis.

The *Veins* arife, fome from the extremities of the Arteries, and others by large open Mouths from the Cells of the Penis.

The greater number of the Veins unite into a Trunk, called *Vena Magna Penis*, which runs in the fuperior Groove formed by the union of the Corpora Cavernofa, and is furnifhed with Valves, and with thick ftrong Coats.

The Vena Magna, at the under end of the Symphyfis Pubis, feparates into Right and Left Plexus, which pafs to the correfponding Iliac Veins.

To an obftruction of the courfe of the Blood through the Veins, by the preffure of the Mufcles at the root of the Penis, together with an increafed influx through the Arteries, is owing that accumulation of Blood in the Corpora Cavernofa, which occafions a diftenfion of the Penis.

The relaxation of the Penis happens from the caufes which produced the diftenfion being removed ;—the Elaftic Ligamentous Membrane which covers the Penis again forcing the Blood from the Cells into the Veins.

Upon the Surface of the Penis, there are fmall fuperficial Veins, which communicate with thofe deeper feated, and commonly terminate by one or more Branches in the Veins at the top of the Thighs.

Thefe Branches affift in carrying on the circulation, and return part of the Blood during the diftenfion of the Penis.

Of the *Lymphatics* of the Penis, thofe from the Prepuce and Skin, in general, go to the right and left Inguinal Glands, while the Lymphatics from the Glans and Body of the Penis accompany the Arteries into the under part of the Pelvis.

The *Nerves* of the Penis are large in proportion to the fize of that Organ. They come from the Hypogaftric Plexus, and principally from the laft Sacral Nerves, and are diftributed chiefly upon the Ligamentous Sheath which inclofes the Corpora Cavernofa.

They are fituated upon the Dorfum of the Penis, more laterally than the Arteries which lie between them and the principal Vein.

For the *Mufcles* of the Penis, fee Part II.

The Penis ejects the Semen into the Vagina, and ferves for the conveyance of the Urine from the Bladder.

OF THE

ORGANS OF URINE AND GENERATION

IN THE FEMALE.

THE *Kidneys*, *Renal Glands*, and Ureters, have the ſame ſituation and ſtructure as in the Male.

The *Bladder* has alſo the ſame ſituation behind the Oſſa Pubis, but riſes higher when it is in the diſtended ſtate.

It is proportionally larger than the Bladder of the Male, and is broader from one ſide to the other, correſponding to that part of the Cavity of the Pelvis to which it belongs.

The *Urethra* is much ſhorter,—being ſcarcely two inches in length,—and ſtraighter than in the Male, having only a ſlight bend downwards between its extremities.

It is produced from the moſt depending part of the Bladder, has no proſtate Gland, but is furniſhed, as in the Male, with *Lacunæ*, which open into it, and diſcharge a Mucus to defend it from the Urine.

The Parts of Generation in the Female (which are here ſuppoſed to be in the unimpregnated ſtate) are divided into *Internal* and *External*. The former conſiſt of the Uterus and its Appendages, the latter are thoſe which are ſeen without any Diſſection.

INTERNAL PARTS.

THE *Uterus*, *Matrix*, or *Womb*, is a hollow Viſcus, ſituated in the Pelvis, in the Hypogaſtric Region, between the Bladder and Rectum, with which it is connected.

It is of a *triangular figure*, and a little flattened before and behind, but more ſo anteriorly; is large above, ſmall below,

below, and has two angles at its upper and lateral parts, called *Corners* of the *Uterus*.

It is diſtinguiſhed into *Fundus*, or upper part, which includes the ſpace above the inſertion of the Fallopian Tubes, the *Body* or middle, and *Cervix* or under part, the two laſt being nearly of equal length.

The extent and figure of the Uterus varies conſiderably in different ſubjects.—In Women who have never been pregnant, it is commonly about two inches and a half in length, from one inch and a half to two inches in breadth at the Fundus, and about half as broad at the Cervix.—It is near an inch in thickneſs, and is larger in Women who have born Children, than in the Virgin ſtate.

The Cavity, like the external part of the Uterus, is of a *triangular form*, but is ſmall in proportion to the ſize of the Organ,—being ſcarcely capable of containing the Kernel of an Almond,—and has its ſides cloſely applied to each other.

It is covered externally through its whole length, with a ſmooth poliſhed Coat, continued from the Peritoneum, which, at the under part of the Cervix, is reflected forwards upon the Bladder, backwards over the Rectum, and laterally towards the Sides of the Pelvis.

Its ſubſtance is of a compact, Cellular, and Fleſhy nature, and plentifully ſupplied with Blood-veſſels: The Fleſhy Fibres, however, are ſeen diſtinctly only in the Gravid Uterus.

It is remarkably Vaſcular in its Body, leſs ſo in its Cervix, and is nearly of the ſame thickneſs throughout, excepting at its Corners, where the Uterine or Fallopian Tubes terminate.

It is lined with a fine and very vaſcular Membrane, of a ſomewhat Porous and Villous appearance, in which the Arteries terminate which diſcharge the Menſtrual Fluid.

The Cavity of the Cervix has *two ſmall Longitudinal Lines* projecting in it, one in the anterior, the other in the poſterior part, on each ſide of which are numerous *Rugæ*.

The *Rugæ* run, in an obliquely tranſverſe direction, and are formed, not only of the inner Membrane, but alſo by the Fibres which compoſe the Body of the Uterus.

Between the Rugæ are many ſmall *Follicles*, which diſcharge a Mucus for lubricating the parts near which they

they are placed :—Some of them, being of a roundiſh form, were miſtaken by NABOTH for Female Ovula.

The under part of the Cervix projects into the Vagina, ſomewhat in form of the Glans Penis, and is perforated by a tranſverſe ſlit, termed *Os Tincæ*, from its ſuppoſed reſemblance to the Mouth of the Tench Fiſh.

The *Os Tincæ*, in an Uterus which has never been impregnated, is about the ſize of the orifice of the Urethra in the Male, but nearly twice as large in the Uterus of a Woman who has born Children.

It is ſmooth on its external ſurface, is placed obliquely in a direction towards the back-part of the Vagina, and is ſurrounded with ſeveral Mucous Follicles.

APPENDAGES OF THE UTERUS.

The *Appendages* of the Uterus, are the *Broad* and *Round Ligaments*, the *Ovaria*, the *Fallopian Tubes*, and the *Vagina*.

The *Ligamenta Lata*, termed ſometimes *Alæ Veſpertilionis*, from their reſemblance to the Wings of a Bat, are two Membranous productions, or Doublings of the Peritoneum, ſent from the edges of the Uterus and poſterior extremity of the Vagina, to be fixed to the ſides of the Pelvis.

Along with the Uterus, they ſeparate the Pelvis into anterior and poſterior Cavities, and are themſelves divided into large and ſmall, or anterior and poſterior Alæ or Pinions.

They contain and ſupport the Ovaria and Uterine Tubes, with part of the Spermatic and Uterine Veſſels and Nerves. They likewiſe incloſe a portion of the Ligamenta Rotunda, &c. connect the Uterus to the ſides of the Pelvis, and aſſiſt in retaining it in its place. In the time of Geſtation they become effaced, by furniſhing the Uterus with part of its external covering.

The *Ligamenta Rotunda* are two long and ſlender Cords, compoſed of Veſſels and Ligamentous Fibres, ariſing from the Corners of the Uterus, immediately before and below the Fallopian Tubes, from which they deſcend obliquely in the Ligamenta Lata, diminiſhing a little in their courſe towards the Groins.

They paſs through the Rings of the Abdominal Muſcles, in the ſame manner as the Spermatic Cords do in

in the Male, and are afterwards inserted by separate Branches into the upper and lateral parts of the Pudendum.

They aſſiſt the Ligamenta Lata in preſerving the equilibrium of the Uterus.

The *Ovaria*, anciently called *Teſtes Muliebres*, are ſituated at the ſides of the Fundus of the Uterus, about an inch diſtant from it, and are contained in the poſterior Pinions of the Ligamenta Lata, which form a Coat to them ſimilar to the Tunica Albuginea Teſtis.

The Ovaria are plain above, and prominent and ſemioval below, flattened at their anterior and poſterior Surfaces, and the ſize of each, when in a ſtate of the greateſt maturity, nearly equal to half of the Male Teſticle.

They are large, uniform, and ſmooth, in the vigour of life, but become ſmall, unequal, and ſhrivelled, in Old Women, or in thoſe who have born many Children.

They are attached to the Uterus by the Ligamenta Lata, and by two ſmall Cords, termed *Ligamenta Rotunda Ovarii*, which were miſtaken by the Ancients for Vaſa Deferentia, carrying a ſecreted Liquor to the Uterus.

They are compoſed internally of a looſe whitiſh Cellular Subſtance, intermixed with Veſſels and Nerves, and contain a number of ſmall Veſicles, called *Ova*, filled with a limpid Fluid, which partakes of the qualities of the White of an Egg.

Theſe Veſicles differ much in ſize in the ſame Ovarium ;—the largeſt of them are ſeldom equal to the ſize of a ſmall Garden-pea.

The number of Ova is differently eſtimated by different Anatomiſts,—from ten to twenty and upwards having been found in one Ovarium.

According to experiments made by Mr Hunter, it is aſcertained,—that the number of originally exiſting Ova in each Ovarium, whether that number be greater or ſmaller, may be diminiſhed, but cannot be increaſed.

The Ovaria ſerve for the nouriſhment of the Ova, which contain the rudiments of the Fœtus.

The *Uterine*, or *Fallopian Tubes*, compared in ſhape, by Fallopius, to that of a Trumpet, are two Conical and Vermiform Canals, attached to the Corners of the Uterus, and terminating in it, each by a *ſmall Opening* which ſcarcely admits the entrance of a Briſtle.

They become gradually larger in their paſſage towards the

the ſides of the Pelvis: Near their outer extremity, they are convoluted and conſiderably dilated, but are afterwards ſuddenly contracted, and terminate by *open Mouths* ſufficiently large to admit the point of a Gooſe-quill.

Their outer ends are free and fluctuating in the Pelvis, and expand into many irregular jagged or pointed extremities, called *Fimbriæ*, which are conſiderably longer at one ſide of the Tube than the other.

They are commonly upwards of a hand-breadth in length, and contained in a Doubling of the Ligamenta Lata.—In their natural ſituation, they lie near the Ovaria; but when drawn out and extended, are a Finger's-breadth diſtant from them.

The ſtructure of the Tubes is nearly the ſame with that of the Uterus, and, like it, they are capable of dilatation and contraction: Their inner ſide, however, has a different appearance, being furniſhed with many ſmall longitudinal Plicæ, which are moſt conſpicuous towards the outer extremities.

The Tubes are ſuppoſed to convey the prolific part of the Male Semen from the Uterus to the Ovaria, in order to fœcundate the Ova; and by graſping that part of the Ovarium where the ripeſt Ovum is ſituated, to carry the Ovum, according to ſome Authors, or its contents only according to others, to be mixed with the Male Semen, and to be lodged in the Cavity of the Uterus.

The *Vagina* is a Membranous Canal, which extends from the Neck of the Uterus to the opening of the Pudendum.

It is ſituated behind the Bladder and Urethra, and before the under part of the Inteſtinum Rectum, to each of which it is cloſely connected by Cellular Subſtance.

It begins a little above the Internal Orifice of the Uterus, but reaches higher at the poſterior than anterior part; from which circumſtance, together with a ſlight Curvature it has backwards, the Canal is found to be longer in its poſterior than anterior Surface.

From the Os Tincæ, it paſſes downwards and forwards, and terminates between the Labia Pudendi, the Axis of the Vagina forming a conſiderable Angle with that of the Uterus.

The dimenſions of the Vagina correſpond with the ſize of the Penis in the Male; but vary according to the temperament of the Body, and become larger in Women who have born Children.

The

The Body of the Vagina is compoſed of thick, ſtrong, Membranous parts, and furniſhed internally with numerous irregular *Rugæ* or Wrinkles, and Nervous *Papillæ*, the former of which conſiderably diminiſh the capacity of the Canal, and the latter add to its ſenſibility.

The *Rugæ* run in a tranſverſe direction, and are ſo diſpoſed as to divide the Vagina into anterior and poſterior *Columns*, which join together laterally, and produce a *Raphe* or Suture at the right and left ſides.

They are deepeſt, largeſt, and moſt crowded upon the anterior and towards the outer part of the Vagina; are moſt conſpicuous in Virgins, leſs ſo in married Women, and become more and more effaced in thoſe who have born Children.—The Rugæ facilitate the diſtenſion of the Vagina during Child-birth.

The whole extent of the Vagina, particularly towards its outer extremity, is furniſhed with ſmall *Follicles*, the orifices of which can frequently be ſeen.

They ſupply a *Mucus*, with which the Canal is always lubricated, and which is diſcharged, in time of Coition, in ſuch abundance, as to have been formerly conſidered as an emiſſion of Female Semen.

The outer end of the Vagina is covered, on each ſide, by a Subſtance compoſed of Blood-veſſels and Cells ſimilar to thoſe of the Penis, and deſcribed by DE GRAAF under the name of *Plexus Reteformis*, and by later Anatomiſts under that of *Corpus Cavernoſum Vaginæ*.

The *Corpora Cavernoſa* are covered by the Sphincter Vaginæ Muſcle, the action of which, joined to the Dilatation of theſe Bodies, ſerves to contract the entry of the Vagina in the time of Coition.

The *Uſe* of the Vagina is to receive the Penis and Semen, and to convey from the Uterus the Menſtrual Flux, the Fœtus, the Secundines, and the Lochia.

The Uterus, with its Ligaments, Ovaria, and Uterine Tubes, are ſupplied with Blood from the Spermatic and Uterine Arteries.

The *Spermatic Arteries* ariſe from the Aorta, as in the Male, and run in the Ligamenta Lata, to be diſperſed upon the Ovaria and Uterine Tubes, and afterwards upon the Uterus itſelf.

The *Uterine Arteries* are derived from the Internal Iliacs, and are much larger than the Spermatics. They direct their courſe, firſt to the under part of the Uterus, after

after which they afcend along its edges, and near its upper part join the Spermatic Arteries.

From the Uterine chiefly, and partly from the Spermatic Arteries, many fmall Branches are furnifhed, which run in a ferpentine manner, and communicate with their fellows in the oppofite fides of the Uterus.

The Vagina is fupplied with an Artery on each fide,—termed *Vaginal*,—from the Uterine, and with fmall Branches from the Umbilical, Middle Hæmorrhoidal, and Pudendæ Communes.

The *Spermatic Veins* have the fame termination as in the Male, but are confiderably larger.—The other Veins run into the Internal Iliac.

The *Lymphatics*, like the Blood-veffels, run alfo in two Sets. Thofe of the one fet accompany the Spermatic Blood-veffels, and, like the Abforbents of the Teftes in the Male, go to the Lumbar Glands. Thofe of the other correfpond with the Hypogaftric Blood-veffels, and terminate in the Glands at the lateral parts of the Pelvis.

The *Nerves* are from the Sacral and Great Sympathetics.

The *Ufe* of the Uterus is,—to receive from the Ovaria, by means of the Fallopian Tubes, the Rudiments of the Fœtus,—to nourifh it, and, after bringing it to maturity,—to expel it through the Os Internum Uteri and Vagina.—From the Inner Surface of the Uterus, the Menftrual Evacuation is alfo difcharged.

External Parts.

The *External Parts*, called *Pudendum* or *Vulva*, are formed of two prominent fides, termed *Labia Pudendi*, *Labia Externa*, or *Alæ Majores*. Thefe are contiguous, when the Limbs are not much feparated, thereby preventing the accefs of Air to the Internal Parts, which they at the fame time protect and conceal.

The upper part of the Pudendum, named *Pubes*, or *Mons Veneris*, is fituated on the fore-fide of the Offa Pubis, and is covered with Hair fimilar to that in the Male, and beginning to grow about the fame period of life.

The Pubes is compofed of the Common Integuments, under which a confiderable quantity of Fat is fituated, rendering it thick, foft, and prominent.

The *Labia Pudendi* extend from the Pubes to within about

about an inch of the Anus, the ſpace between the Pudendum and Anus obtaining the name of *Perineum*, from a moiſture ſuppoſed to flow about this part of the Skin. —It is ſometimes alſo called *Anterior Perineum*, to diſtinguiſh it from that part which extends from the Anus to the Coccyx, termed by ſome Anatomiſts *Poſterior Perineum*.

The opening between the two Labia has the name of *Foſſa Magna*;—it increaſes a little in ſize and depth as it deſcends, and forms a ſmall boat-like Cavity at its under extremity, termed *Foſſa Navicularis*.

The Labia are thickeſt above, become thinner below, and terminate in a tranſverſe fold of the Skin, named *Frænum*, *Furcula*, or *Fourchette*, which is frequently lacerated in the firſt Child-birth.

The Labia are compoſed of the Skin elevated by a large quantity of Cellular Subſtance and ſome Fat, and lined by a very Vaſcular Membrane, which is thin, tender, and red like the inſide of the Lips, and is furniſhed with numerous Sebaceous Follicles, ſecreting a Liquor, whereby the parts are preſerved ſmooth and moiſt.

Between the upper ends of the Labia, is the Subſtance named *Clitoris*, and by ſome *Mentula Muliebris*,—not exceeding an inch in length, and little more than the third part of that in thickneſs, and tied down to the fore-part of the Symphyſis Pubis.

It is extremely Vaſcular and Nervous, and is compoſed, like the Penis in the Male, of two *Crura* and *Corpora Cavernoſa*, contained in a Ligamentous Sheath, with a Septum between them.

The *Crura* are upwards of twice the length of the *Body* of the Clitoris, and, together with Muſcles belonging to them, ariſe, as the Crura of the Penis do in the Male, from the Crura of the Oſſa Iſchia and Pubis.

The Clitoris is alſo provided with a *Ligamentum Suſpenſorium*, by which it is connected to the Oſſa Pubis, and with a *Glans*, which, like that of the Penis, is extremely ſenſible, but has no perforation in it for the paſſage of the Urine.

It is covered by a continuation of the Skin of the Labia, which, at its inferior extremity, forms a Semilunar Fold, termed *Preputium Clitoridis*.

The Prepuce is furniſhed with *Glandulæ Odoriferæ* upon its inner Surface, and with a ſmall Frænum which fixes it to the Glans.

In

In the time of Coition, the Glans Clitoridis is ſuppoſed to produce nearly the ſame ſenſation in the Female, as the Glans Penis does in the Male.

At the under and outer part of the Clitoris are two Bodies, called *Nymphæ*, from their being ſuppoſed to preſide over and direct the courſe of the Water proceeding from the Bladder.

The *Nymphæ* ariſe narrow from the Prepuce and Glans, and run obliquely downwards and outwards along the inſide of the Labia, increaſing in breadth, but ſuddenly contracting again at their lower extremity.

They are chiefly formed by a production of the inſide of the Labia, have the ſame florid colour with them, and in their natural ſtate are contiguous, and cover the Orifice of the Urethra.

They are ſometimes of unequal ſize, and not unfrequently, particularly in warm climates, they project beyond the edges of the Labia.

Their Internal Structure conſiſts of Cellular Subſtance, with a large proportion of Blood-veſſels. They have alſo many Nervous Papillæ, which render them very ſenſible, and Sebaceous Follicles, the contents of which prevent them from being injured by the Urine.

The Nymphæ aſſiſt in directing the courſe of the Urine from the Urethra, and in preventing the Air from entering the Vagina.—They alſo tend to enlarge the Paſſage for the Child in the time of Parturition.

Between the Perineum and Nymphæ, there is a ſmooth *Cavity* or *Veſtibulum*, which is moſt complete in Virgins, and leads to two Paſſages, viz. to the Urethra above, and to the Vagina below.

The *Orifice of the Urethra* is placed a little below the Glans of the Clitoris, and between the two Nymphæ, and is ſurrounded by a Spongy Eminence, which projects at its under part,—called by ſome Authors *Corpus Glandulosum*, or *Glandulæ Proſtatæ Mulierum*.

The Corpus Glanduloſum is perforated by *Lacunæ*, ſome of which are of conſiderable depth, and diſcharge a Viſcid Matter round the Orifice of the Urethra.

The *Orifice of the Vagina*, termed likewiſe *Os Externum Uteri*, is placed immediately under that of the Urethra, and is naturally ſtraiter than the reſt of the Canal, but in the Virgin ſtate is ſtill more contracted by the Subſtance called *Hymen*, or *Circulus Membranoſus*, which partly ſurrounds it.

The *Hymen* approaches to a Circular Figure, but the Circle is frequently incomplete next the orifice of the Urethra, the broad part being turned towards the Perineum.

When the Hymen is ruptured, it degenerates into ſmall Conical Papillæ, termed *Carunculæ Myrtiformes*, from their ſuppoſed reſemblance to Myrtle-berries.

The Hymen has been conſidered as a Teſt of Virginity; —but neither the preſence nor abſence of this Membrane can be depended upon as a certain Criterion.

About the Orifice of the Vagina are ſeveral Mucous Follicles, ſimilar to thoſe round the Opening of the Urethra.

The *Blood-veſſels* and *Nerves* of the External Parts are from the Pudic Branches, and are diſperſed in numerous Ramifications upon the end of the Vagina, Labia Externa, and Clitoris.

The *Abſorbents* paſs partly to the Inguinal Glands, and partly to thoſe placed at the ſides of the Pelvis, or upon the Lumbar Vertebræ.

OF

OF THE GRAVID UTERUS.

WHEN the Rudiments of the Fœtus have been conveyed from one of the Ovaria into the Cavity of the Uterus, through the medium of the correſponding Uterine Tube, whether in the ſtate of a Fluid only, or of a complete Ovum, Impregnation is ſaid to have taken place.

Some days after Impregnation has commenced, an *Ovum*, conſiſting of a Veſicle filled with a limpid Fluid, is found in the Cavity of the Uterus.

The Ovum, when firſt viſible, is obſerved to have a ſmooth Surface, but in a ſhort time thereafter it ſends off flocculent Branches, the greater part of which are by degrees converted into a *Placenta* at that part of the Uterus where the Ovum happens to be firſt attached.

The Rudiments of the Fœtus, however, are not always conveyed to the Uterus after Impregnation, for ſometimes a Fœtus is found in the Ovarium; at other times in one of the Uterine Tubes; and ſome rare Inſtances have occurred, where the Embryo has dropped from one of the Ovaria or Tubes, into the Cavity of the Abdomen, where a Placenta has been formed, by which it has been nouriſhed.

The Ovum, at an early period of Geſtation, conſiſts of a thin *Membranous Capſule*, which incloſes the Embryo or Germ with the Umbilical Cord and Waters; and the Capſule, again, conſiſts of an internal Membrane called *Amnios*, on the outſide of which is the *True Chorion*, which is covered with a Filamentous and Spongy Subſtance, termed by RUYSCH *Tunica Filamentoſa*, and by more modern Authors, *Falſe* or *Spongy Chorion*.

The *Spongy Chorion* is deſcribed by DR HUNTER as conſiſting, in early Geſtation, of *two Layers*, one lining the Cavity of the Uterus, and termed by him *Membrana Decidua*, from being ſuppoſed to be caſt off from the Uterus: The other, covering that part of the Ovum which does not adhere to the Uterus, he terms *Decidua Reflexa*.

The *Decidua* is leaſt diſtinct between the Uterus and

 Placenta.

Placenta. Near the edge of the Placenta, both it and that part of it called *Reflexa*, are thickeft and ftrongeft, and decreafe in thicknefs towards the other end of the Uterus and Ovum, in proportion as thefe become more expanded.

The Decidua and Decidua Reflexa unite into one Membrane in advanced Geftation. They have been fuppofed to be formed originally by an efflorefcence thrown out upon the parts on which they are placed, in the manner it is thrown out upon inflamed furfaces.

Between the Amnios and Chorion, a *Gelatinous Fluid* is contained in the early Months, at which period a fmall *Bag*, filled with a milky-like Fluid, is obferved on the Amnios, near the Umbilical Cord, and is termed *Veficula Umbilicalis* or *Alba*.

The *Veficula Umbilicalis* is connected to the Cord by a Filament confifting of an Artery and Vein, which, with the Fluid and Bag, foon difappear. The ufe of this Veficle, which has fometimes been miftaken for an *Allantois*, is not yet underftood.

In early Geftation, the Ovum is large in proportion to the Embryo; but towards the latter period of Pregnancy, the proportion is reverfed, as appears from the following Obfervations.

No well authenticated account has been yet received, of the Embryo being obfervable till near the end of the third Week, when it is found to appear like an oblong Veficle floating in the limpid Liquor of the Ovum.

In the fourth Week, the Ovum is about the fize of a Pigeon's Egg, and the Embryo not larger than that of a common Fly.

About the end of the third Month, the Ovum is the fize of a Goofe's Egg, and weighs eight ounces, while the Embryo is between two and three ounces in weight, and three inches in length;—and the Head and Extremities being now diftinctly obfervable, it obtains the name of *Fœtus*, which it retains from this time till the end of Geftation.

In the fixth Month the Placenta and Membranes weigh feven or eight ounces, the Fœtus twelve or thirteen, and is eight or nine Inches in length, and perfect in all its external parts.

At Birth, the Secundines weigh only between one and two pounds, the Fœtus fix or feven, and is from eighteen to twenty-two inches in length.

Still,

Still, however, from the difficulty of aſcertaining when Pregnancy commences,—from the differences of Fœtuſes of the ſame age in different Women, and in the ſame Woman in different Pregnancies, and—from the Fœtus being frequently retained in the Uterus ſome time after it is dead, as well as from the ſmall dependance to be placed upon many of the Figures given of theſe Parts,—the above Obſervations are not altogether to be depended upon.

Changes Produced in the Uterine System by Impregnation.

Immediately after Impregnation, a large *Orifice* is conſtantly obſerved in the Ovarium, leading to a *Cavity* in that part of it from whence the Rudiments of the Fœtus have been derived.

This *Cavity* appears firſt flocculent, and is afterwards filled up with a Granulous Subſtance, which has the name of *Corpus Luteum*, from the yellow appearance it aſſumes, eſpecially in Quadrupeds.

The *Corpus Luteum* conſiſts of an outer Vaſcular, and an inner Inorganic-looking Subſtance, which has been conſidered by ſome Authors as the remains of the Ovum.

The Corpus Luteum is not found till after Impregnation. It continues during Pregnancy, and for ſome time after Delivery, when it gradually vaniſhes, but leaves a *Scar* in the Ovarium, which continues for life.—The number of Corpora Lutea correſponds with that of the Ova impregnated.

After the Embryo is received into the Cavity of the Uterus, the Os Tincæ is ſhut up by a *Ropy Mucus* ſecreted from the Follicles in the Cervix Uteri; the Menſtrua *ceaſe to flow*,—and the Uterus by degrees is changed from a triangular to an *oval* form.

From the influx of Blood, and the growth of the Ovum, the Cavity of the Uterus gradually enlarges from a ſize capable only of admitting an Almond, to that which contains the full-grown Fœtus, the Secundines and Waters; compoſing together a Maſs equal to nine or ten pounds weight.

Some time after Impregnation, the Fundus and Body of the Uterus, being ſofter and looſer than the Cervix, firſt yield to the parts which it contains.

For the two first Months, the Uterus increases so little as to remain in the Cavity of the Pelvis, and it is generally after the third Month, before the Tumour formed by it can be felt above the Symphysis of the Pubis.

During the first three Months, the Os Tincæ remains smooth and even, and its Orifice is nearly as in the unimpregnated state; but between the third and fifth Month, the Cervix and Orifice begin to be dilated, the former becoming softer, and the latter changing its common appearance, and projecting more into the Cavity of the Vagina.

The Uterus continues to rise through the whole period of Gestation, but frequently inclines a little to one side.—In the seventh Month, it reaches the Umbilicus, and at last touches the Scrobiculus Cordis, Stomach, and Colon, occupying the whole of the Umbilical and Epigastric Regions.

In the progress of Gestation, the whole Uterus becomes softer, looser, and more Vascular, and the Vessels are greatly enlarged, the proportional increase being nearly similar to that of the Uterus.

The course of the Arteries is remarkably convoluted,—fully as much so as they are previous to Conception,—and greatly more so than that of the corresponding Veins.

The Veins are much larger than the Arteries, their diameters being such as to have distinguished them by the name of Sinuses;—and to them the great bulk of the Uterus is chiefly owing.

The substance of the Uterus was formerly supposed by some to be thicker, and by others to be thinner in the Gravid, than in the unimpregnated state; but the generality of Anatomists seem now sufficiently satisfied, that it is nearly of the same thickness in both states, and during the whole term of Pregnancy.

In the latter Months, the Tubercle of the Os Uteri is considerably enlarged, and the firmness of its texture converted to the Spongy softness of the Body of the Uterus. The transverse Rima or Orifice is changed into an oval Pit, and in Women who have born several children, it is considerably dilated near the end of Gestation.

The situation of the Appendages of the Uterus is also considerably altered. The Ovaria, with the Tubes and Ligaments of the Uterus, are lower situated, in respect to the Fundus Uteri, in proportion as it ascends; and at the

the full time, the Broad Ligaments, by aſſiſting in forming a covering to the Uterus, are nearly obliterated.

In the enlarged ſtate of the Uterus, the *Muſcular Fibres* are diſtinctly ſeen.—They form Faſciculi which run in various directions, but cannot be traced far without interruption.

A deſcription is given by Ruysch of a *Circular Muſcle* in the bottom of the Uterus, for the expulſion of the Placenta;—but the Placenta is found to adhere to other parts beſides the Fundus Uteri; nor has ſuch a Muſcle been obſerved by later Anatomiſts.

The Muſcular Fibres of the Uterus aſſiſt in the delivery of the Child and expulſion of the Placenta; and in a few days afterwards, the Uterus, partly by the contractile power of theſe Fibres, and partly by that of the Blood-veſſels, is reſtored to near its former dimenſions.

Contents of the Uterus about the end of Pregnancy.

The Contents of the Uterus, towards the end of Pregnancy, conſiſt of the *Fœtus*, the *Umbilical Cord*, *Placenta*, *Membranes*, and *Waters*.

The Cord, Placenta, and Membranes, are named the *Secundines*, or *After-birth*, with which ſome include the Waters, though theſe are diſcharged previous to the expulſion of the Child.

The *Cord* is fixed by one end to the Umbilicus of the Fœtus, and by the other it is attached to the Placenta at a little diſtance from its middle, from which circumſtance the extraction of the Placenta is more eaſily effected.

It is commonly about two feet long,—in ſome inſtances more, in others leſs;—but in general it is of ſufficient length to allow the Birth of the Child, while the Placenta adheres to the Uterus of the Mother.

Its thickneſs is nearly equal to that of one's Finger, but ſmaller and weaker at the extremity next the Placenta.—It is ſeldom of a cylindrical form, being marked with Sulci correſponding to the courſe of its Veſſels.

It is compoſed of *one Vein* and *two Arteries*, which twiſt about each other in a ſpiral direction, and are covered by a ſmooth Coat derived from the Membranes.

The Trunks of the Veſſels are incloſed in a *Gelatinous*

Cellular Subſtance, which adds to the ſtrength and elaſticity of the Cord, and allows the Blood to paſs freely between the Fœtus and Placenta, without being in danger of interruption from preſſure.

The *Vein* is much larger than the Arteries; it is deſtitute of Valves, and ſends off no Branches till it reach the Fœtus.

It ariſes from the ſubſtance of the Placenta, and, after perforating the Umbilicus, it paſſes in the inferior part of the Ligamentum Suſpenſorium, to the under ſide of the Liver.

The *Arteries* ariſe from the Iliac Arteries of the Fœtus, perforate the Umbilicus, and run to the Placenta, in the ſubſtance of which they divide into their ultimate Branches, where the Ramifications of one Artery frequently form large Anaſtomoſes with thoſe of the other, and both communicate with the Branches of the Vein, in the manner Arteries and Veins do in other parts of the Body.

The *Uſe* of the Cord is, by means of the Vein, to convey pure Blood from the Placenta for the nouriſhment of the Fœtus, and, through the medium of the Arteries, to return what is not uſed in Nutrition, again to be mixed with the Blood of the Uterus.—By the intervention of the Cord alſo, the Placenta is more readily extracted.

The *Placenta*, ſo called from its reſemblance to a broad Cake, is a ſpongy maſs, of a round form, occupying near a fourth part of the Ovum.

It is about ſeven or eight inches in breadth, and upwards of one inch in thickneſs, but is thinner at the edges where the Membranes go off.

The external ſurface, or that next the Uterus, is divided into Lobules with deep Fiſſures, while the internal, or that next the Fœtus, forms a regular Maſs, which has numerous large Branches of the Umbilical Veſſels diſperſed upon it.

In the Placenta are to be obſerved,—on the ſide next the Child, the Ramifications of the Umbilical Veſſels forming the principal part of its ſubſtance;—on the ſide next the Mother, Branches of the Uterine Arteries, almoſt of the ſize of Crow-quills, paſſing in a convoluted manner between the Uterus and Placenta, and terminating in the latter;—Veins correſponding with theſe Arteries, but flat and of great ſize, running obliquely to the Uterus,—and, in the ſubſtance of the Placenta, an Ap-

pearance

pearance which has been supposed by many Authors to be the common Cellular Membrane, of a tender nature, and easily ruptured by injection, but which is considered by late Authors as a regular Spongy Substance, similar to that in the Body of the Penis.

The Placenta is connected to the Uterus on one side, by Blood-vessels and by the Decidua, and to the Fœtus on the other, by means of the Umbilical Cord.

The common place of attachment is near the Fundus Uteri, though it is found at different times adhering to all the other parts of the Uterus, not even the Os Tincæ excepted.

In the case of Twins, there is sometimes only one, but most frequently two distinct Placentæ, adhering together by the intervention of a Membrane in which the Vessels of the two Placentæ occasionally communicate with each other.

There are in these cases also, two distinct Apartments separated by a Partition, each Apartment containing its own Waters and Cord.

The *Use* of the Placenta is, to receive Blood from the Uterus, and, according to the opinion of modern Anatomists, to purify it, (as the Lungs do in the Adult), for the nourishment of the Fœtus.

The *Membranes* consist of the *Spongy Chorion*, the *True Chorion*, and the *Amnios*.

They form a complete but slender *Bag*, which lines the Cavity of the Uterus, and incloses the Fœtus, Umbilical Cord, and Waters.

The *Spongy Chorion* is a thick opaque substance, which adheres to the Uterus, and forms the outer Layer of the Ovum, but scarcely penetrates between the Lobules of the Placenta.

Between the Uterus and Placenta, it is less distinct than elsewhere, being perforated there, and in some degree concealed by the Blood-vessels proceeding from the inside of the Uterus.

It has a Spongy and Villous appearance, and is full of small Blood-vessels, which can be readily injected from those of the Uterus.

The *True Chorion*,—the term derived from *Chorus* a *Company*, *numerous* Vessels being found to exist in it in the Quadruped,—is thinner, smoother, and much denser than the former.

It

It is connected with the Spongy Chorion as far as the edge of the Placenta, where it ſeparates from it, is reflected over the Surface of the Placenta, which is oppoſed to the Fœtus, and is afterwards continued over the whole of the Cord.

It is uniform in its texture, has a tranſparent appearance, adheres to the Spongy Chorion and Surface of the Placenta, by a delicate Cellular Subſtance, and has no Veſſels viſible to the naked Eye, or which can be injected.

The *Amnios*,—ſo called, according to ſome Authors, from its ſuppoſed reſemblance to a Veſſel uſed by the Ancients for the reception of Blood in Sacrifice,—lines the Surface of the True Chorion, and, with it, is reflected from the Placenta upon the Cord, which it ſupplies with an external covering.

It is thinner, more denſe, and tranſparent, than the Chorion, to which it adheres every where by a Jelly.

It is ſmooth and poliſhed on the ſide next the Fœtus, and is deſtitute of Blood-veſſels.

The Membranes, beſides containing the Child and Waters, give origin to the latter, and, in the time of Labour, aſſiſt in opening the Orifice of the Uterus.

The *Waters*, called *Liquor Amnii*, are thinneſt and cleareſt in the firſt Months, after which they acquire ſome degree of colour and ropineſs.

The *Liquor Amnii* is chiefly compoſed of the Serum of the Blood. In its natural ſtate, it has all the characters of the Liquor Pericardii, or of the Liquors exhaled from the Surfaces of other Membranes ſimilar to the Pericardium.—It is ſuppoſed to be derived from the Exhalent Arteries of the Amnios.

It is proportionally greater in quantity in the firſt than in the laſt Months, but the proportion and quantity vary conſiderably in different Women, and in the ſame Woman in different Pregnancies.

Between the Amnios and Chorion, Water is frequently collected, but in much ſmaller quantity than in the Amnios, and is termed *Falſe Water*, or *Falſe Delivery*.—It is frequently diſcharged ſome time previous to the Birth of the Child, without any danger.

The Liquor Amnii defends the Child and Umbilical Veſſels from the preſſure of the Uterus, aſſiſts in diſtending

ing the Uterus during Geſtation, and allows the Fœtus a certain degree of motion.

In the time of Labour, it alſo aſſiſts in dilating the Mouth of the Uterus, and, by lubricating the Vagina, facilitates Delivery.

Peculiarities of the Fœtus.

All the Bones of the Body, excepting a few, are *ſoft*, *yielding*, and *imperfect*, and many of them entirely in a *ſtate of Cartilage*.

The Head is *large* in proportion to the reſt of the Body, and the Bones of the Cranium are united by *Membrane*, which allows the ſize of the Head to be diminiſhed, whereby its Paſſage is facilitated in the time of Delivery.

Between the Frontal and Parietal Bones, is the Membrane called *Bregma*, formed by the Dura Mater and Pericranium, which commonly diſappears before the Child is two years of age, the margins of the Bones being then united.

—The other peculiarites of the Bones of the Fœtus are taken notice of in the Deſcription of the Bones of the Adult.—

There is a *large proportion* of Fluids, and the Solids are generally *ſofter* than in the Adult.

The Skin is of a *bright red colour*, in conſequence of its greater degree of Vaſcularity.

That part chiefly of the Cellular Membrane is *Adipoſe*, which is upon the Surface of the Body; ſcarcely any Fat being found in the interior parts, where it gradually accumulates as the perſon grows older.

The Brain, Spinal Marrow, and Nervous Syſtem, are proportionally *larger*, but *ſofter*.

The Sanguiferous Syſtem, and Glandular Organs, are *larger*.

In the Eye is the *Membrana Pupillaris*, which ariſes from the inner margin of the Iris, and completely covers the Pupil.

It ſeparates the Cameræ from each other, and is very Vaſcular. According to Blumenbach, it keeps the Iris expanded, during the rapid increaſe of the Ball of the Eye.

The Cryſtalline Lens is almoſt *Spherical*, and has numerous *Veſſels* diſperſed upon its Capſule.

The

The Meatus Auditorius is wholly *Cartilaginous*, and adheres by its extremity to an imperfect Bony Circle, in which the Membrana Tympani is placed.

The Meatus Externus, and Membrana Tympani, are lined by a *Mucous Membrane*, which is caſt off after Birth.

The Thymus Gland, in the Fœtus, is a *large* Subſtance, ſituated in the upper part of the Thorax, between the Layers of the Anterior Mediaſtinum.

It lies over the Pericardium, and occupies the ſpace where the Aorta ſends off the Carotid and Subclavian Branches, and extends a ſhort way into the fore-part of the Neck.

It has *two long Cornua* above, and *two broad Lobes* below, is of a pale-red colour, and becomes afterwards of a darker hue.

A *white ſerous Liquor* can frequently be ſqueezed from its ſubſtance; but it has no Excretory Duct; nor is the uſe of the Fluid, or of the Gland itſelf, yet aſcertained.

Some Anatomiſts are of opinion, that the white Fluid is Chyle ſent by a retrogade motion from the Thoracic Duct, and that the Thymus Gland is a Diverticulum to the Chyle, when too great a quantity of Lymph is ſent to the Subclavian Vein.

In the Adult, the Thymus Gland is ſo completely abſorbed, that ſcarcely any thing but Cellular Subſtance remains in its place.

The Blood-veſſels of the Thymus are Branches of the Subclavian and Internal Mammary; the Nerves come from the Great Sympathetics and Eighth Pair.

Its Lymphatics have not yet been very accurately traced.

The Lungs are ſmall, firm, and of a dark-red Colour, and *ſink* when thrown into water, in conſequence of the Bronchial Cells having not yet received Air.

But if Air be admitted to them by putrefaction or otherwiſe, they ſwim in Water, in the ſame manner as if Air had been conveyed to them in conſequence of Reſpiration.

The Valve of Euſtachius is *diſtinct* in the Fœtus, but frequently Cribriform in the Adult, is *larger* in proportion, and is ſuppoſed to direct the Blood of the Inferior Cava, immediately through the Foramen Ovale to the Left Auricle.

In the back-part of the Septum, between the Right and Left Auricles, is the *Foramen Ovale*, nearly equal in ſize to the Mouth of the Inferior Cava, bounded by a thick Muſcular edge, termed *Annulus Foraminis Ovalis*.

Upon the left ſide of the Foramen Ovale, a *Membranous Valve* is placed, which allows part of the Blood of the Right Auricle to paſs through the Foramen Ovale immediately to the left one, but which completely prevents its return.

The Blood going through the Foramen Ovale, aſſiſts in keeping up the balance of Circulation between the two ſides of the Heart, till the Lungs be ready to receive it.

The Pulmonary Artery divides into three Branches, the right and left of which run to the Lungs, while the middle one, called *Ductus Arterioſus*, larger than both the other Branches, and its area nearly equal to that of the Foramen Ovale, paſſes in an oblique direction to the beginning of the deſcending Aorta.

The Ductus, or Canalis Arterioſus, forms nearly one half of the Aorta, carries part of the Blood of the Right Ventricle into that Artery, without allowing it to paſs to the Lungs; and the Aorta, formed in this manner, receives the force of both Ventricles, by which it is more enabled to ſend Blood through the Umbilical Arteries to the Placenta.

The Stomach is of a *rounder* form than in the Adult, and commonly contains a ſmall quantity of a *Gelatinous Matter*.

The Appendix Vermiformis is *larger* in proportion, and is inſerted into the extremity of the Colon, which, at this time, does not project to form a proper Cæcum.

The Colon, and frequently alſo the end of the Ilium, are filled with a *greeniſh black Fæces*, of a viſcid conſiſtence, termed *Meconium*.

The Liver is *ſo large* as to occupy both Hypochondriac Regions.

The *Umbilical Vein* paſſes from the Umbilicus, in a duplicature of the Peritoneum, to the left Branch of the Vena Portæ, and carries the Blood from the Placenta to the Liver.

From the Trunk of the Umbilical Vein, where it terminates in the Liver, a Branch, called *Ductus*, or *Canalis Venoſus*, runs in a ſomewhat waving direction, and joins

joins the Left Vena Hepatica, where that Vein enters the Cava.

The Ductus Venoſus is much ſmaller than the Trunk of the Umbilical Vein, and carries part of the Blood of the Vein directly to the Heart, without allowing it to enter the Circulation in the Liver.

The Umbilical Vein ſends Branches to the Right Lobe of the Liver, but is principally diſtributed through the Left Lobe; while the Right Branch of the Vena Portæ carries the Blood of the Splenic and Meſenteric Arteries to the Right Lobe of the Liver.

After Birth, the Left Lobe of the Liver, which was formerly more particularly ſupplied by the Umbilical Vein, receives an additional proportion of Blood from the Vena Portarum.

The reaſon why the Umbilical Vein goes partly to the Cava, and not entirely to the Heart, is not underſtood.

The Kidneys are irregular on their Surface, being formed of *Lobes*, each of which conſiſts of a Cortical, a Medullary part, and a Papilla, and is covered by a Proper Membrane.

The Glandula Renalis is almoſt *as large* as the Kidney, but afterwards rather diminiſhes than increaſes in ſize.

The Bladder of Urine is of a *long* form, and extends almoſt to the Umbilicus. The greater part of it is above the Pelvis, and is more particularly covered by the Peritoneum than in the Adult.

The Urachus, which is of a *Conical form*, aſcends from the bottom of the Bladder, between the Umbilical Arteries, and between the Peritoneum and Linea Alba, to the Umbilicus, and vaniſhes by degrees in the Umbilical Cord.

It is formed by a production of the Fundus Veſicæ, and in the Human Body is generally ſolid, forming a Suſpenſory Ligament of the Bladder.

It has been ſometimes found hollow at its beginning, and has been ſaid to be ſo, in one or two inſtances, throughout its whole length.

In the Fœtal Quadruped, it is a large Tube, which tranſmits Urine from the Bladder to a Bag between the Amnios and Chorion, called *Allantois*.

The common Iliac Arteries divide, on each ſide, into a *ſmall* External, and *large* Internal Branch.

The principal part of the Internal Iliac is occupied in forming the *Umbilical Arteries*, which mount by the ſides of

of the Bladder, on the outſide of the Peritoneum, and perforate the Umbilicus in their progreſs to the Umbilical Cord.

Soon after Delivery, the Foramen Ovale, Ductus Arteriosus, and Venoſus, with the Umbilical Vein and Arteries, begin to contract, and are, in general, completely cloſed, and the Veſſels ſhrivelled into Ligaments within a year after Birth.

This obliteration is produced by a contractile power in the parts, by a preſſure in the ſurrounding Viſcera, and by the Blood being directed through other channels.

The Pelvis of the Fœtus is commonly ſo *ſmall*, that the principal parts of its Viſcera are contained in the open Cavity of the Abdomen.

The Prepuce of the Clitoris is proportionally ſo much *larger* in a young Fœtus than it is afterwards, that, in an Abortion, a Female Fœtus has been frequently miſtaken for a Male.

The Teſtes are lodged during the greater part of Geſtation, in the Cavity of the Abdomen, over the Pſoæ Muſcles, and a little below the Kidneys.

They then conſtitute a part of the Abdominal Viſcera, and, in a ſimilar manner with them, are connected to the Body by a production of the Peritoneum, which forms their Tunica Albuginea.

Between the Teſticle and Scrotum, a Fibrous and Vaſcular Subſtance, of a Conical form, is extended,—called by Mr Hunter, *Gubernaculum*, or *Ligamentum Teſtis*, which he conſiders as a principal agent in directing the courſe of the Teſticle, and in making way for it in its deſcent.

About the eighth Month of Pregnancy, the Teſtis, by means not yet completely aſcertained, paſſes gradually along to the Scrotum, a Proceſs of the Peritoneum preceding it, which afterwards forms its Vaginal Coat.

The Teſtis, through the whole of its courſe, continues to be covered by the Peritoneum, is connected to the parts on which it reſts, and has its Veſſels paſſing to it from behind forwards, the ſame as when ſituated in the Abdomen.

While the Teſticle is paſſing through the Ring of the Abdominal Muſcle, the Ligamentum Teſtis is found to be in ſome meaſure inverted, and to form the under and fore-part of the Vaginal Coat, on which the Cremaſter Muſcle is expanded.

After the deſcent of the Teſticle, the Peritoneal Proceſs, which deſcends along with it, begins to contract at the Ring, and a firm adheſion of its ſides, to within a little diſtance of the Teſticle, is commonly found to be produced by the time of Birth.

Position of the Fœtus.

In the firſt Months, the Embryo ſwims in the Liquor Amnii, free from the preſſure of the ſurrounding parts; —and from many diſſections and obſervations made by the lateſt Anatomiſts, it is aſcertained,—that the Head preponderates, and in general continues undermoſt till the Child is delivered.

Formerly it was ſuppoſed, that the Embryo, in the firſt Months, was ſituated with the Head uppermoſt, and that, in the latter Months, the attitude of the Fœtus was inverted.

The Fœtus is obſerved to be coiled up into as round a figure as poſſible, ſo as to be properly adapted to the Cavity of the Uterus.

The Head is bent towards the Thorax, and the Arms are folded:—The Knees are drawn towards the Abdomen, and the Heels towards the Nates.

The Spine is bent into an Arch, and one ſide of the Body of the Fœtus is frequently turned forwards.

The Head is placed diagonally, with its long Diameter correſponding to that of the Pelvis, and the Occiput oppoſed to the Os Tincæ.

Circulation of the Blood in the Fœtus.

The Blood is ſent by the Arteries of the Uterus to the Subſtance of the Placenta, from which, according to moſt of the ancient Anatomiſts, it paſſes to the Umbilical Vein by a direct communication of Branches; or, according to the opinion of the greater part of modern Anatomiſts,—by Abſorption.

By the Umbilical Vein, it goes principally to be circulated in the Liver, and by the Ductus Venoſus, a ſmall portion of it goes to the Right Auricle of the Heart.

The Blood ſent from the Inferior Cava is tranſmitted by the Foramen Ovale to the Left Auricle, and that ſent by

by the Superior Cava is tranſmitted to the Right Auricle and Ventricle, and from thence to the Pulmonary Artery.

From the Pulmonary Artery, one portion of it paſſes through the Circulation of the Lungs, and another goes by the Ductus Arterioſus to the Aorta Deſcendens.

From the Lungs it is returned by the Pulmonary Veins to the Left Auricle, where it mixes with that coming from the Right Auricle by the Foramen Ovale, and is ſent by the Aorta to the different parts of the Body.

From the Iliac Arteries, it is conveyed by the Umbilical Branches to the Subſtance of the Placenta, where one portion of it returns by correſponding Veins to the Fœtus, the reſt going to the Uterus in the manner it was diſcharged from the Uterine Arteries to the Branches of the Umbilical Vein.